FINAL

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT

Joliet Army Ammunition Plant
Will County, Illinois

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ACRONYMS AND ABBREVIATIONS

ACSIM	Assistant Chief of Staff for Installation Management
Army	United States Army
BRK	bedrock well
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	centimeters per second
CO_2	carbon dioxide
COC	contaminant of concern
COMBO	combined overburden/bedrock well
CSM	conceptual site model
2,4-DNT	2,4-dinitrotoluene
2,6-DNT	2,6-dinitrotoluene
2-A-4,6-DNT	2-amino-4,6-dinitrotoluene
4-A-2,6-DNT	4-amino-2,6-dinitrotoluene
DO	dissolved oxygen
DVR	data validation report
February	February/March quarterly sampling
ft	foot/feet
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
FSP	Field Sampling Plan
GMZ	Groundwater Management Zone
GOU	Groundwater Operable Unit
GRU	Groundwater Remediation Unit
H_2O	water
HMX	High Melting-point Explosive
in.	inch
IAC	Illinois Administrative Code
IC	institutional control

ID/IQ	Indefinite Delivery/Indefinite Quantity
IEPA	Illinois Environmental Protection Agency
J	estimated concentration
JOAAP	Joliet Army Ammunition Plant
LAP	Load-Assemble-Package area
LTM	long-term monitoring
LTM Plan	Final Long-term Monitoring Plan for Environmental Remediation Services
MDL	method detection limit
MFG	manufacturing area
mg/L	milligrams per liter
ml/min	milliliters per minute
MNA	monitored natural attenuation
MWH	MWH Americas, Inc.
MS/MSD	matrix spike/matrix spike duplicate
NB	nitrobenzene
ND	not detected
NPL	National Priority List
2-NT	2-nitrotoluene
OD	outside diameter
ORP	oxidation-reduction potential
OU	operable unit
OVB	overburden well
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RA	remedial action
RDX	Royal Demolition Explosive
RG	Remedial Goal
RI	Remedial Investigation
ROD	Record of Decision
SOU	Soil Operable Unit
SpC	specific conductivity

SQL	Sample Quantitation Limit
SVOC	semi-volatile organic compound
TAL	target analyte list
TNB	1,3,5-trinitrobenzene
TNT	2,4,6-trinitrotoluene
TolTest	TolTest, Inc.
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Command
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

This report has been prepared by TolTest, Inc. (TolTest) in conjunction with teaming partner MWH Americas, Inc. (MWH), for environmental remediation services at the former Joliet Army Ammunition Plant (JOAAP) on behalf of the United States Army Environmental Command (USAEC) Assistant Chief of Staff for Installation Management (ACSIM) under Indefinite Delivery/Indefinite Quantity (ID/IQ) Contract No. W91ZLK-05-D0012, Delivery Order 0001.

This report presents the Spring 2012 (February/March [February] and April) groundwater quality data for the long-term monitoring (LTM) program of the Groundwater Operable Unit (GOU) and landfill inspection documentation for March and April inspections for the Soil Operable Unit (SOU) at JOAAP in response to the *Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas* (U.S. Army, 1998), (ROD) for the JOAAP facility. The remedy that was selected for the GOU Sites at JOAAP was monitored natural attenuation (MNA). As a function of the MNA remedy for the Groundwater Remedial Units (GRUs), LTM is required. This requirement is intended to satisfy three primary objectives:

1. Monitor contaminant concentration reductions and plume migration;

2. Verify containment of contaminant concentrations greater than Remedial Goals (RGs) within the Groundwater Management Zones (GMZs); and

3. Evaluate the effectiveness of SOU remedial actions (RAs) and MNA for the GOU remedy.

These objectives are being met through implementation of the LTM program.

In addition to the GOU, the SOU remedial actions included the construction of three landfills at Sites L3, M11, and M13. Landfill inspections are required quarterly to determine if the remedy continues to function as designed. Post-closure inspection reports for March and April for landfills L3, M11, and M13 are included in Appendix A.

The objective of this report is to provide a data submittal of the groundwater quality sampling results, provide a review of the data collected during spring 2012, and provide documentation of landfill inspections. Additionally, water table and potentiometric surface maps for the March quarterly (Landfill M13) and April semi-annual sampling event are included.

1.1 FACILITY DESCRIPTION AND BACKGROUND

Joliet Army Ammunition Plant was a former United States Army (Army) munitions production facility located on approximately 36 square miles (23,542 acres) of land in Will

County, Illinois (Figure 1-1). The former facility is located approximately 60 miles southwest of Chicago and 14 miles south of Joliet, Illinois. As shown on the Groundwater Studies Area Map and Landfill Sites (Figure 1-2), the JOAAP property is divided into two main functional areas: the Manufacturing (MFG) Area, west of Route 53, and the Load-Assemble-Package (LAP) Area, east of Route 53. The facility has been described in detail in Section 1.1 of the *Final Long-term Monitoring Plan for Environmental Remediation Services* (LTM Plan [TolTest/MWH, 2010]).

The MFG Area, covering approximately 14 square miles (9,159 acres), is where the chemical constituents of munitions, propellants, and explosives were produced. The production facilities were generally located in the northern half of the MFG Area. In the southern half of the MFG Area, there was an extensive explosives storage facility. The LAP Area, covering approximately 22 square miles (14,383 acres), is where munitions were loaded, assembled, and packaged for shipping. The LAP Area contained munitions filling and assembly lines, storage areas, and a demilitarization area.

Joliet Army Ammunition Plant was constructed during World War II. The production output varied with the demand for munitions. Although the plant was used extensively during World War II, all production of explosives halted in 1945. At that time, sulfuric acid and ammonium nitrate plants were leased out, and the remaining production facilities were put in layaway status. The installation was reactivated during the Korean War, and again during the Vietnam War. Production gradually decreased until it was stopped completely in 1977.

Hazardous wastes were generated and released into the environment through several pathways. Process waters used in the production and handling of 2,4,6-trinitrotoluene (TNT) and other compounds were discharged into drainage systems. Buildings and equipment were periodically washed to remove explosive residues and the wastewater would be allowed to leach into the ground or flow into the local surface water and creeks. Later, process water incineration or industrial wastewater treatment produced ash or explosives residue that accumulated over time. Ash from the incineration of production by-products was stored in landfills on-site. Equipment and demolition materials were flashed (burned) to remove residues. Fire training areas, used to keep fire and safety personnel suitably prepared, introduced contaminants to the soil and groundwater. Leaks and spills occasionally occurred in the storage and handling of oils and other liquids. Wastes and unusable explosives and munitions were burned or detonated. In addition, munitions were tested, leaving some residuals in the soil at the test sites. Vehicle and equipment maintenance, transformer leaks, and the handling of pesticides introduced further contamination to the soil.

Wastes generated during production activities resulted in environmental contamination at various sites around JOAAP. Because of this contamination, the United States Environmental Protection Agency (USEPA) placed the MFG Area on the National Priority List (NPL) on July 21, 1987 and the LAP Area on the NPL on March 31, 1989.

The contaminated media identified at JOAAP were divided into two operable units (OUs) to aid in the development and evaluation of remedies. The SOU consists of sites where contaminated soils, sediments, and debris were identified. The GOU consists of sites where contaminated groundwater was identified. Surface water was determined to pose no risk to health and the environment and therefore is not addressed further as a contaminated media. However, surface water discharge is a major component of the shallow groundwater system, and localized detections of explosives may occur near contaminated groundwater sites. For this reason, surface water is relevant to the GOU.

Substantial land at JOAAP is not contaminated. Transfer activities for that land have occurred and some are still underway. After remaining potential hazards to human health and the environment are addressed under the SOU and these properties are found suitable for transfer under Public Law 104-106 and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Army will prepare documentation for transfer.

The Illinois Land Conservation Act of 1995, PL 104-106, Div. B, Title 2901-2932, February 10, 1996, states that the Army will transfer JOAAP land to various federal, local, and state jurisdictions. Transfer of land is occurring incrementally as it is remediated and is deemed appropriate. As of production of this report, the distribution of JOAAP land through these incremental transfers is approximately 17,726 acres to the United States Department of Agriculture (USDA) for establishing the Midewin National Tallgrass Prairie; 982 acres to the Department of Veterans Affairs to establish a Veterans Cemetery; 455 acres to Will County, Illinois to establish the Will County Landfill; and 2,885 acres to the State of Illinois to establish two industrial parks.

Where groundwater contamination is present within areas to be transferred, the Army has included institutional controls (ICs) in the transfer documents to prevent exposure to contaminants, limit groundwater pumping, and prevent manipulation of the natural groundwater flow patterns through any means. These controls will help to limit the spread of the remaining contamination in groundwater and will remain in effect with the land until removed by mutual agreement of the Army, USEPA, Illinois Environmental Protection Agency (IEPA), and the current landowner.

1.2 NATURAL ATTENUATION MECHANISMS

The selected remedial action for the GOU is remediation by natural attenuation. A detailed overview of the physical, chemical, and biological criteria, which are most directly linked to natural attenuation mechanisms and the site-specific criteria used to evaluate natural attenuation at JOAAP is provided in the LTM Plan and annual groundwater monitoring reports where natural attenuation is evaluated and reported.

1.3 RECORD OF DECISION REQUIREMENTS

The ROD specified general groundwater monitoring requirements. These requirements were based on information presented in the Remedial Investigation (RI) Report and did not have the additional information provided by the predesign investigation completed in 1998 or subsequent remedial actions completed at JOAAP. As such, the Army applied subsequent site data as well as historic data to arrive at site-specific LTM locations and analytes, which were included in the LTM Plan.

Based on the objectives presented in Section 1.2 of the LTM Plan and as an extension of the ROD, several types of monitoring are required for each site. These include:

- Collection of groundwater samples to evaluate contaminant concentrations;
- Collection of surface water samples where groundwater discharges to surface features to evaluate surface water contaminant concentrations;
- Collection of depth to water measurements to evaluate groundwater flow;
- Documentation and evaluation of source removal or surface disturbing activities;
- Documentation of changes in surface water features, impoundments, or conveyances; and
- Evaluation of evidence concerning illicit water withdrawal affecting contaminant migration.

1.4 LONG-TERM MONITORING PLAN

Monitoring activities are required pursuant to the decision documents developed for the various contaminated sites found at JOAAP. The LTM Plan was produced to present LTM activities for the GOU and required SOU maintenance activities. The LTM Plan includes activities associated with long-term maintenance of the remedies selected for JOAAP. The objective of the LTM Plan was to provide a sufficiently detailed description of the monitoring strategy and process and to establish realistic expectations for execution of the program on the part of all stakeholders. With respect to the latter objective, it is the intent of the plan to establish both the actions to be taken in the event of various sampling outcomes and the set of conditions required to reduce and eventually discontinue long-term monitoring efforts where practicable. As such, it includes sample collection and analysis of ground and surface water, surveillance of cap maintenance and access restrictions at landfills, and surveillance of land use restrictions and other ICs implemented on an installation-wide basis.

Section 3.1 of the LTM Plan summarizes the GMZs and monitoring well designations and discusses the decision tree for interpretation of groundwater quality results and the logic for

optimizing site monitoring programs. Section 3.2 of the LTM Plan discusses IC monitoring required as part of the MNA remedy.

The LTM program is presented in Section 4.0 of the LTM Plan which includes a discussion of site-specific monitoring programs for the GMZs and landfills, monitoring well installations, abandonments, monitoring schedules, requirements for IC monitoring, and reporting schedules. Tables A1-1 through A1-9 of Appendix A (Field Sampling Plan, [FSP]) of the LTM Plan provide specific information about the monitoring requirements at each site. However, it is expressly presented that the LTM program will likely change with changing conditions. Therefore, the LTM Plan tables were consolidated into a single table that is continually updated based on groundwater monitoring results and periodic reviews. The sampling completed for spring 2012 is presented as Table 1-1 in this report and summarizes the monitoring locations and requisite analyses for those sample locations.

The LTM Plan provides a site-specific evaluation of the natural attenuation remedial option that is being applied to all GOU sites. The purpose of the LTM Plan is to:

- describe the process by which data will be collected and analyzed,
- determine if remedies in place at JOAAP are protective of human health and the environment,
- describe the nature of monitoring results that, if observed, would indicate further action be taken because the remedy does not appear to be sufficiently protective,
- prescribe the conditions under which certain monitoring activities may be terminated, and
- provide a detailed description of activities to monitor the GOU natural attenuation RA.

Section 5 of the LTM Plan describes reporting requirements for LTM activities. The LTM Plan reporting schedule requires the submittal of a semi-annual report, which is a presentation of the results of the winter and spring sampling events with minimal analysis, and an annual report that presents the results of the summer and fall sampling event with detailed evaluation of trends in the groundwater data. The semi-annual sampling schedule identified in the LTM Plan indicates that the sampling periods will generally be January and October of each year at all sites except Landfill M13, which is sampled quarterly, generally in January, April, July, and October of each year. In 2012, the winter quarterly sampling event at Landfill M13 was conducted during February and the spring semi-annual sampling event was conducted in April. Annual groundwater monitoring reports are the venue in which data are analyzed and proposed changes to the LTM Plan are presented. Acceptance of the final annual groundwater monitoring report by regulators will constitute approval of recommended changes in the monitoring program.

The LTM Plan also provides for a five-year review of the GOU natural attenuation remedy and SOU remedy, as required by the ROD. Natural attenuation data were collected during the Fall 2003 sampling event to facilitate the first five-year review. The First Five-Year Review Report was completed following the Fall 2003 sampling event. The Final Second Five-Year Review Reports for the GOU and SOU were submitted in August 2009. Subsequent five-year reviews will be completed to evaluate the effectiveness of the GOU and SOU remedies and, if necessary, provide recommendations to modify the remedy to make it more effective. The Third Five-Year Review Report will have the GOU and SOU remedy protectiveness evaluated in one consolidated document. Furthermore, if the third five-year review suggests that natural attenuation may not result in reasonable agreement with ROD requirements, evaluation of available contingency remedies will be presented as part of the five-year review process.

2.0 SITE ACTIVITIES

This section provides a summary of the LTM Plan requirements, the groundwater monitoring activities at each of the GOUs, and the SOU RA landfill inspections.

2.1 GROUNDWATER MONITORING

This section provides a summary of the field activities undertaken to perform winter and spring quarterly groundwater monitoring at Landfill M13, and spring semi-annual monitoring at remaining GOU and SOU sites. Site L2 was not sampled in Spring 2012 as recommended in the 2009 Annual Report. Site L14 was not sampled in Spring 2012 as recommended in the 2010 Semi-annual Report.

The measurement of water levels at the monitoring wells was conducted using an electronic water level indicator. Depth to water was measured from a datum mark on the top of the well casing at each monitoring well. All measurements were to an accuracy of +/- 0.01 foot (ft).

In accordance with the standard operating procedure for low-flow sampling, monitoring wells were purged and sampled using low flow sampling techniques at a flow rate of approximately 100 to 250 milliliters per minute (ml/min). Dedicated ¼-inch (in.) outside diameter (OD) Teflon™ lined polyethylene tubing is installed in each monitoring well. The Teflon™ lined polyethylene tubing is connected with dedicated silicon tubing to a variable speed peristaltic pump. During purging, the pump discharge tube is attached to a multi-probe water quality meter equipped with a flow-through cell. The water quality meter is equipped with probes for measuring field parameters including temperature, pH, specific conductivity (SpC), oxidation/reduction potential (ORP), and dissolved oxygen (DO). The water quality meters were calibrated daily in accordance with Appendix A (FSP) of the LTM Plan and the manufacturer's instructions.

Measurements of field parameters were taken at 2-minute intervals and recorded on Groundwater/Surface Water Sampling Forms. Final field purge parameters are summarized in Table 2-1. Purging of each monitoring well was considered complete when field parameters stabilized over three successive measurements to within 10%. Upon stabilization of the field parameters, the required samples were collected from the discharge tube of the pump into laboratory-supplied containers after disconnecting the flow-thru cell.

Samples were collected in laboratory supplied preserved containers for explosive compounds in one-liter amber glass bottles; target analyte list (TAL) metals in one-liter, nitric acid preserved polyethylene bottles; inorganic parameters nitrate and sulfate in 250 milliliter unpreserved polyethylene bottles; volatile organic compounds (VOCs) in 40 milliliter, hydrochloric acid preserved glass vials; and semi-volatile organic compounds (SVOCs) in one-liter amber glass bottles. Samples were analyzed by Test America,

University Park, Illinois in accordance with Appendix B – Quality Assurance Project Plan (QAPP) of the LTM Plan. Samples collected for inorganic parameters TAL metals, nitrate, and sulfate were field filtered using high capacity 0.45 micron cartridge filters.

2.1.1 February 2012 Monitoring

TolTest/MWH measured water levels at eleven monitoring wells and sampled eight monitoring wells as summarized in Table 1-1. The first quarterly monitoring event in 2012 at Landfill M13 was conducted on 29 February and 01 March 2012.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Groundwater elevations are summarized in Table 2-2 for the MFG.

Groundwater monitoring was conducted in accordance with Appendix A (FSP) of the LTM Plan, as described above.

Blind duplicate samples were collected at a rate of 10% (1 per 10) for each analyte sample total. Blind duplicate M13-MW999 was collected at parent location M13-MW809 at Landfill M13 for VOCs, SVOCs, explosives, TAL metals, nitrate, and sulfate.

Matrix spike/matrix spike duplicate (MS/MSD) samples are collected at a rate of 5% (1 per 20) for each analyte sample total.

Third-party Level III data validation was completed for all groundwater and surface water samples collected. Based on the results of the validation, a data usability report was completed and is included in Appendix B1 and data validation reports are included in Appendix B2 of this report.

2.1.2 April 2012 Monitoring

TolTest/MWH measured water levels or surveyed a total of 142 monitoring wells and surface water locations at JOAAP. A total of 34 monitoring wells and 1 surface water location were sampled at the MFG (M1, M6, M7, M9, other areas, Landfill M11, and Landfill M13) and 10 monitoring wells and 5 surface water locations were sampled at the LAP Area (sites L1 and L3/Landfill L3) as summarized in Table 1-1. Field activities were conducted from April 10 through 17, 2012 in accordance with Appendix A (FSP) of the LTM Plan.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Surface water elevations are determined by referencing to the known elevations of nearby benchmarks using a level and rod and from marks on existing structures (bridges) for some locations; where at others a direct measurement with a water level indicator was completed. All gauging and surveying measurements were taken to an accuracy of +/- 0.01 ft. All surface water locations contained water during gauging and

sampling activities. Water level measurements and surveying activities for each site were generally completed within a 24-hour period.

Monitoring well information for the MFG area monitoring wells and water levels measured in February and April 2012 are summarized in Table 2-2. Monitoring well information for the LAP area monitoring wells and water levels at monitoring wells measured in April 2012 are summarized in Table 2-3. Surface water elevations are summarized in Table 2-4. Groundwater and surface water hydraulics are discussed in Section 3 on a site by site basis.

Groundwater sampling was conducted in accordance with Appendix A (FSP) of the LTM Plan, as described above. Surface water samples were collected by directly immersing the sample container into the surface water body so as to fill the bottle if filtration was not required. If filtration was required, a peristaltic pump with tubing placed directly in the surface water body was used for sample collection.

Blind duplicate samples are collected at a rate of 10% for each analyte sample total. The majority of the duplicate samples were collected from monitoring wells that had previous analyte detections. Duplicate samples were collected from eight monitoring wells in the LAP and MFG areas in April 2012. Details concerning field duplicates for April 2012 are as follows:

Duplicate Sample Number	Monitoring Point Sampled	Site	Sample Date	Analyte
MW994	MW652	M6	4/14/2012	Explosives
MW995	MW123R	M6	4/14/2012	Explosives
MW997	MW642	M1	4/12/2012	Sulfate
MW998	MW641	M1	4/12/2012	Sulfate
MW999	MW630	L3/Landfill L3	4/11/2012	Explosives and TAL Metals
MW999	MW362	M13	4/16/2012	VOCs, SVOCs, Explosives, TAL Metals, Nitrate, and Sulfate

Matrix spike/matrix spike duplicate samples are collected at a rate of 5% for each analyte sample total.

Third-party Level III data validation was completed for all groundwater and surface water samples collected. Based on the results of the validation, a data usability report was completed and is included in Appendix B1. Data validation reports are included in Appendix B2 of this report.

Repair activities completed during the April 2012 sampling activities included the following:

- A new lock was added to L1 monitoring well MW173
- A new lock was added to L3 monitoring well MW3
- A weep hole was drilled in the protective casing for M1 monitoring well MW104
- A new well cap was added to MFG monitoring well MW118

Additional required repair activities identified include the following:

- The hinge requires repair on L3 well MW411
- A new lock and weep hole are required at M9 monitoring well MW121

These required repair activities will be completed during the fall 2012 sampling round.

2.2 LANDFILL INSPECTIONS

Post-closure monitoring requirements for Landfills L3, L11, and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for 15 years at Landfill M13 and 30 years at Landfills L3 and M11. The LTM Plan states that the L3 Landfill cover will be inspected quarterly, the M11 Landfill cover will be inspected quarterly for the first five years and annually for 25 years, and the M13 Landfill cover will be inspected quarterly. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future.
- At M13 ensure the fence and signage installed to restrict site access remain in place and serviceable; and
- At M13 certify that institutional controls remain in place.

According to IAC and the Final LTM Plan, Landfill L3, M11, and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;

- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structure.

In addition, land use restrictions have been imposed across the area within the fence. Annual certification is required to document that none of the following are occurring within the fence:

- Development
- Intrusive work
- Excavation that could mobilize contaminants of concern (COCs)
- Alteration of surface water flow
- Vehicle use other than that associated with maintenance of the cover/cap.

Landfill inspections were conducted on a quarterly basis at landfills L3, M11, and M13 starting in October 2008 in accordance with the LTM Plan. Landfill inspection reports for March and April 2012 are included as Appendices A1 and A2, respectively.

2.2.1 March 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on March 1, 2012 in accordance with the LTM Plan. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. The March Post-Closure Inspection Report is included in Appendix A1.

2.2.2 April 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on April 18, 2012 in accordance with the LTM Plan. Woody vegetation growing on Landfills L3, M11, and M13 were removed prior to the inspection. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. The April Post-Closure Inspection Report is included in Appendix A2.

2.3 INSTITUTIONAL CONTROLS MONITORING

The remedies selected for all areas of JOAAP do not allow unrestricted use of the property or underlying groundwater. Restrictions on use of groundwater are limited to the GMZs and annual certification that the restrictions are being maintained for each GMZ is required. Land use restrictions over and above those associated with groundwater use apply wherever waste or contamination has been left in place at levels that pose an unacceptable risk without some form of ICs. Some of those areas include the three landfills (L3, M11, and M13) with associated restrictions with annual certification. For all other areas with institutional controls there is a need for similar annual certification that the deed restrictions remain in place and are effective. Annual certifications are completed separate from this report. However, during groundwater monitoring and landfill inspections conducted quarterly at Landfill M13 and site-wide sampling conducted semi-annually in 2012, there were no observations of intrusive soil activities, construction, or improper use of groundwater which would affect the GOU or SOU remedies.

3.0 RESULTS AND RECOMMENDATIONS

Groundwater management zones are three-dimensional areas containing groundwater being managed to mitigate impairment according to IAC. The GMZs comprise both the glacial drift and shallow bedrock (Silurian Dolomite) aquifer and are bounded at depth by a confining shale unit (Maquoketa Shale). The GMZs were established with acceptance of the ROD. Any future modification of GMZ boundaries will have to be mutually agreed upon between the Army, USEPA, and IEPA. Groundwater monitoring wells and surface water collection points located inside and/or near the borders provide monitoring points for contaminant plumes. Site-specific plans for GMZs for GOU sites are discussed in Sections 3.1 through 3.6.

Groundwater and surface water samples collected in February and April 2012 were analyzed for one of more of the following parameters: explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs. Analytical results from spring 2012 sampling events for explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs are summarized in Tables 3-1 through 3-5, respectively. This section provides a site-specific presentation of the water level measurements and groundwater and surface water quality sampling results. The discussions are arranged by the GMZs into which each of the sites is grouped. This provides an ability to discuss the contaminant detections in relation to each of the GMZ boundaries.

Each site in Section 3 is organized into the following subsections:

General Site Introduction: General site-specific background information is presented along with any information on site monitoring wells and surface water sampling locations and water elevation measurements.

Groundwater Hydraulics: Site or GMZ figures are presented for the water table and potentiometric surface (generally in the bedrock). For groundwater hydraulic purposes, monitoring wells are designated as overburden wells (OVB), combined overburden/bedrock wells (COMBO), or bedrock wells (BRK). This designation indicates in which aquifer(s) the well is screened. When practical, discussions include the relationship between groundwater flow direction, hydraulic gradients, and contaminant migration.

Analytical Results: Figures are presented for contaminant detections observed during the February (Landfill M13) and April 2012 sampling rounds. For groundwater quality discussions, monitoring wells and surface water sampling points are designated as in-plume, early warning, or compliance points and at Landfill sites as upgradient or downgradient. These designations are included in the LTM Plan and are based on the location of the sampling point relative to historic groundwater detections, site GMZ, and/or site features.

Analytical data from 2012 sampling are included in the discussion of analytical results. Contaminant concentrations that are greater than site RGs are included in the discussion even if there is not a notable change in the analytical data for that constituent.

Most Sample Quantitation Limits (SQLs) are less than site RGs; SQLs are provided for each compound in the Data Validation Report (DVR) presented in Appendix B2. In the discussion of analytical results, 'not detected' (ND) implies that the contaminant concentration is less than site RGs. Analytical data are reported to the SQL. If there were detections between the method detection limit (MDL) and the SQL, the quantity would be flagged "J" as estimated concentration (J). The MDLs are less than the RGs.

Recommendations: Recommendations for each site are presented specific to the conditions of the LTM Plan. A summary of recommendations is presented in Section 4. Since there is little evaluation of trends included in the semi-annual reports, the recommendations included herein are general in nature.

3.1 SITE L1

Site L1 is one of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L1 comprises 80 acres on which munitions production facilities were constructed in 1941. It is centrally located in the northern portion of the LAP Area as can be seen on Figure 1-2. Historically, Site L1 was used for demilitarization and reclamation of various munitions starting with crystallization of ammonium nitrate, but then was converted for shell renovation and 1,3,5-trinitrobenzene (TNB) recovery up until 1945. By April of 1946, it had been reactivated to reclaim TNT.

In the TNT operation, hot water was used to wash the TNT out of shells. The water was discharged to a sump where solid explosives were removed for burning and the overflow (pink water) was routed to a 4.3-acre ridge and furrow evaporation/percolation pond. By 1952, two additional evaporation ponds had been constructed southeast of the ridge and furrow unit on either side of a drainage ditch flowing from it to Prairie Creek. Prairie Creek, the surface water body draining the area, is incised into the bedrock and appears to transmit groundwater that discharges directly or emerges into the streambed by virtue of the head relief available in the open channel.

Explosive residues in soil were observed in the ridge and furrow impoundment, the western most of the two newer ponds, the area south of the washout building, and the soil around the sump. The underlying groundwater contains TNT, TNB, 2,6-dinitrotoluene (2,6-DNT), and royal demolition explosive (RDX) both in the alluvium and in the shallow weathered bedrock, as well as degradation products from those parent compounds, as a result of the infiltration of pink water and possibly continued leaching of explosives in soil. The footprint of remedial goal (RG) exceedances currently extends to the southeast of the source area (in the proximity of MW131) to monitoring well MW173. Soil source control measures at the ridge and furrow pond were conducted in 2005 to 2006. The

contamination is now a legacy groundwater plume continuing to migrate to the southeast towards Prairie Creek, where it is believed to largely discharge into the creek through upwelling. Given these observations, the contaminant footprint is expected to separate from the source area over time and migrate in the alluvium and shallow bedrock until it discharges to Prairie Creek.

The overburden aquifer generally consists of a complex stratification of clay and silt, with some silty gravel observed in the eastern portion of the site near MW174. Overburden generally thins from approximately 20 ft in the north to less than 5 ft in the south and from approximately 15 ft in the east to 5 ft in the west.

3.1.1 Groundwater Hydraulics

The groundwater monitoring network at Site L1 consists of 16 wells: 8 overburden wells, 1 combined overburden/bedrock well, and 7 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW171, MW175, MW176, MW177, MW178, MW400, MW610, MW611 and WES2. Monitoring well information and water levels for April are summarized in Table 2-3. The groundwater flow direction in the overburden aquifer is generally toward the southeast as shown on Figure 3-1.

The horizontal gradient in the northern part of Site L1 was calculated to be 0.0118 feet per foot (ft/ft) and in the southern part of Site L1 was calculated to be 0.0126 ft/ft in April (Table 3-6). Using the reported average of 9.2E-06 centimeters per second (cm/sec) for hydraulic conductivity and an assumed porosity of 0.30, the calculated flow velocity in the overburden at Site L1 was approximately 0.0011 feet per day (ft/day) or 0.402 feet per year (ft/yr) in April (Table 3-7). As stated in the LTM Plan, a value of 16 ft/yr will be used to evaluate data from groundwater early warning sample points, which will accommodate heterogeneities present in the overburden aquifer.

Bedrock wells are installed at shallow depths (<10 ft below top of bedrock). The groundwater flow direction in the bedrock aquifer is generally toward the southeast as shown on Figure 3-2. Prairie Creek, the surface water body draining the area, is incised into the bedrock in the southern and central parts of the site and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. There is no evidence that contamination flows beneath Prairie Creek as it has not appeared in monitoring wells to the west. The groundwater elevation at monitoring well MW611 was greater than the elevation of Prairie Creek, indicating a gaining stream scenario. Vertical gradients observed were upward at well nests MW171/MW177, MW172/MW173, and MW401/MW610 and downward at well nest MW178/MW176 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for shallow groundwater in the vicinity of Site L1.

3.1.2 Analytical Results

Groundwater and surface water sampling points for Site L1 during spring 2012 are summarized in Table 1-1. The following monitoring wells and the surface water sampling location at L1 are sampled for explosives:

- In-Plume – MW131, MW173, and WES1
- Early Warning – MW174 and WES3
- Compliance –surface water sampling point SW550 for the overburden aquifer

Groundwater and surface water samples collected at Site L1 in April 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for April 2012 sampling conducted at Site L1 are summarized in Table 3-1 and on Figure 3-3. A brief discussion of analytical results by well type follows.

In-Plume Wells (MW131, MW173, and WES1): At overburden monitoring well MW131, 1,3,5-TNT exceeded the RG at a concentration of 2,200 micrograms per liter (µg/L) for the April sampling event.

At overburden monitoring well MW173, RDX exceeded the RG at a concentration of 10 µg/L and TNT exceeded the RG at a concentration of 12 µg/L for the April sampling event.

At bedrock monitoring well WES1, TNB exceeded the RG at a concentration of 40 µg/L and TNT exceeded the RG at a concentration of 38 µg/L for the April sampling event.

The continued detection of degradation products 2-amino-4,6-dinnitrotoluene (2-A-4,6-DNT) and 4-amino-2,6-dinnitrotoluene (4-A-2,6-DNT) in samples collected from in-plume monitoring wells indicate contaminant reduction is occurring.

Early Warning Wells (MW174 and WES3): At overburden monitoring well MW174 and bedrock well WES3, there were no RG exceedances of explosive compounds for the April sampling event.

Compliance Point (SW550): At surface water sampling point SW550, there were no detections of explosive compounds for the April sampling event.

3.1.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site L1 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.2 SITE L3/LANDFILL L3

Site L3 is the third of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L3 comprises approximately 50 acres used as a demolition area directly southwest of Site L2 (Figure 1-2). Landfill L3 (described below) occupies 3.32 acres of the Site L3 area (Figure 3-4). Site L3 is bounded on the west by Prairie Creek, the south by an unnamed tributary of Prairie Creek, and the east by Star Grove Cemetery. Predominant use of the area was for open burning of combustibles and munitions crates, including some materials with low level explosive contamination. An air curtain destructor was constructed at the site to reduce emissions, but was never put into use. There was also a one-acre fire training area at the site, a small depression surrounded by an earthen berm.

Specific burning units included "U" and "L" shaped burn pads and a burn cage on a concrete slab. Geophysical surveys noted a number of metallic anomalies buried around the burn pads. The soil was also found to contain lead and RDX contamination at levels requiring remediation. Berms along Prairie Creek were found to contain lead, chlordane, 2,6-DNT, and phosphate above their respective RGs. It has been posited that the contamination in these berms arises from filling activity in the area when the berms were constructed. Unexploded ordnance may also be present in this area. The remedy selected for the area along Prairie Creek was consolidation and capping into what is now called Landfill L3.

Landfill L3 is located along the western edge of the Site L3 GMZ on the east bank of Prairie Creek, as illustrated on Figure 3-4. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the Site L3 Landfill as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

Monitoring at Landfill L3 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;

- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and

- Keep survey points protected and visible to facilitate identification in the future.

Samples from overburden well MW410 are obtained from a silt layer. Samples from combination well MW630 and bedrock well MW412 are obtained at shallow depths (<10 ft below top of bedrock), while samples from bedrock wells MW631 and MW633 are obtained from intermediate depths (10 to 20 ft below top of bedrock).

3.2.1 Groundwater Hydraulics

The groundwater monitoring network at Site L3/Landfill L3 consists of 11 wells: 4 overburden wells, 2 combined overburden/bedrock wells, and 5 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW136, MW137, and MW411. Additionally, the water leve4l was measured in April at Site L2 (which was not sampled in April) monitoring well MW134 to provide horizontal groundwater level control. Monitoring well information and water levels for April are summarized in Table 2-3. Surface water elevation in the northern portion of the site is dictated by the dam located on Prairie Creek just north of Central Road (Figure 3-4). The groundwater flow direction in the overburden aquifer is generally toward the west/southwest as shown on Figure 3-4.

The horizontal gradient in the overburden aquifer at Site L3 was calculated to be 0.0276 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 1.6E-03 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site L3 was approximately 0.4172 ft/day or 152 ft/yr in April (Table 3-7). There are no wells directly downgradient of MW410 or MW412 from which apparent travel times could be estimated. RDX has been observed in Prairie Creek, indicating it has migrated the intervening distance over the last 50 to 60 years but, because the contamination appears to arise from fill activity in the area, the presence of RDX in Prairie Creek water may represent contamination that started much closer to the stream bank than either of the in-plume monitoring wells. Empirical data at Sites L1 and L2 have suggested transport rates more on the order of 2.5 to 11 ft/yr, but hydraulic conductivity may be higher in the disturbed soil of Site L3 and higher gradients found proximate to the discharge line along Prairie Creek. Accordingly, the larger of the two velocities, 11 ft/yr, is assumed for Site L3.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-5. Prairie Creek, the surface water body draining the area, is incised into the bedrock in the southern and central parts of the site and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. There is no evidence that contamination flows beneath Prairie Creek as it has not appeared in monitoring wells to the west. The groundwater elevation at monitoring well MW632 was greater than the elevation of Prairie Creek, indicating a gaining stream scenario. An upward vertical gradient was observed at well nest MW630/MW631 at Site L3 in April (Table 3-8), further supporting a gaining stream scenario.

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site L3/Landfill L3.

3.2.2 Analytical Results

Groundwater and surface water sampling points for Site L3/Landfill L3 during April 2012 are summarized in Table 1-1. The following monitoring wells and surface water sampling points at L3 are sampled for explosives and TAL metals:

- Upgradient – surface water sampling point SW004, where the creek first touches the GMZ boundary and upstream of the storm water outfall
- In-Plume/Downgradient – MW410 and MW412
- Early Warning/Downgradient – MW630, MW631, and MW633
- Compliance/Downgradient – surface water sampling point SW777 for the overburden aquifer, where the creek leaves the GMZ boundary
- Downgradient - Surface water sampling points SW557, upstream of the landfill drainage swale discharge, and SW558, at the constructed drainage swale along the southwest side of the landfill

Groundwater and surface water samples collected at Site L3/Landfill L3 in April were analyzed for explosive compounds and TAL metals in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compounds detected during April 2012 sampling conducted at Site L3 are summarized in Table 3-1 and illustrated on Figure 3-6. Metals detected during April sampling conducted at L3/Landfill L3 are summarized in Table 3-2. For Landfill L3, the monitoring well locations are classified as upgradient or downgradient locations. Therefore, the same well can represent two separate classifications at Site L3/Landfill L3. A brief discussion of analytical results by well type follows:

Upgradient Point (SW004): At surface water sampling point SW004, there were no detections of explosive compounds or metals RG exceedances for the April sampling event.

In-Plume Wells (MW410 and MW412 {downgradient}): At overburden monitoring well MW410, there were no explosive compound detections or metals RG exceedances for the April sampling event.

At bedrock monitoring well MW412, RDX continued to exceed the RG at a concentration of 120 µg/L for the April sampling event. There were no metals RG exceedances for the April sampling event. The continued detection of degradation products 2-A-4,6-DNT and 4-A-2,6-DNT in samples collected from monitoring well MW412 indicate contaminant reduction is occurring.

Early Warning (downgradient) Wells (MW630, MW631, and MW633): At bedrock monitoring well MW630, there was a RG exceedance for RDX at a concentration of 8.7 ug/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

At bedrock monitoring well MW631, there were no explosive compound detections or metals RG exceedances for the April sampling event.

At bedrock monitoring well MW633, RDX continued to exceed the RG at a concentration of 6.7 µg/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

Compliance (downgradient) Points (SW777): At surface water sampling point SW777, RDX was detected below the RG at a concentration of 0.25 ug/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

Additional Downgradient Points (SW557 and SW558): At surface water sampling point SW557, HMX and RDX were detected below the RG at concentrations of 1.1 ug/L and 3.2 ug/L for the April sampling event, respectively. There were no metals RG exceedances for the April sampling event.

At surface water sampling point SW558, there were no explosive compound detections or metals RG exceedances for the April sampling event.

3.2.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site L3/Landfill L3 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.3 SITE M1

Site M1, the southern ash pile, is part of the MFG facility (Figure 1-2), but contains unique contaminants not present at actionable levels at any other GMZ. As such, it is singled out as the fifth of the six GMZs. Site M1 comprises 68 acres in the southwestern part of the MFG facility, where from 1965 to 1974, ash residues from the incineration of “red water” (TNT production waste water) were landfilled and placed on unlined soil. At various times (1985, 1993, and 1996) after closure, polyvinyl chloride (PVC) and clay were used to repair erosion damage to the cover.

Groundwater beneath and downgradient of the pile was observed to contain elevated levels of sulfate, 2,6-DNT, and antimony. The latter two compounds exceeded their respective RG on a single sample event only, but the sulfate has exceeded its RG continuously in groundwater and occasionally in surface water. In February 2003, the United States Army

Corps of Engineers (USACE) submitted E*xplanation of Significance Difference Site M1 – Southern Ash Pile* (USACE, 2003), which expanded the northern boundary of the GMZ for Site M1 to encompass concentrations of sulfate in excess of the RG that had migrated beyond the original boundary.

The elevated sulfate is believed to originate in leachate from the Site M1 ash pile that infiltrated through the soil and entered the shallow groundwater. Dissolved sulfate then migrated to the northwest. Sulfate-containing groundwater flows into Prairie Creek, which is located northwest of the former ash pile. Concentrations of sulfate have been measured as high as 46,000 milligrams per liter (mg/L), or over 100 times the RG of 400 mg/L. As recently as 2000, surface water samples were collected that exceeded the RG of 500 mg/L. The ash piles were removed in 2006-2007 eliminating the primary source of sulfate. Consequently, dissolved sulfate in groundwater is now a legacy plume migrating to the northwest.

The overburden aquifer primarily consists of silt and clay, with scarce amounts of sand and silty gravel at the bedrock contact. Sand is abundant in the higher, unsaturated, parts of the site. Over most of Site M1, the overburden thickness is fairly consistent between 15 and 20 ft thick. At the northern end of the site, near MW642/MW641, the overburden consists entirely of silty gravel and the depth to bedrock is greater than 40 ft. The presence of Prairie Creek in the western part of M1 suggests that Prairie Creek is the discharge point for shallow groundwater.

3.3.1 Groundwater Hydraulics

The groundwater monitoring network within this site consists of 18 wells: 10 overburden wells, 4 combined overburden/bedrock wells, and 4 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW104, MW105, MW106, MW201, MW347, MW351, and MW647. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally to the northwest, as shown on Figure 3-7.

The horizontal gradient at Site M1 was 0.0303 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 6.6E-05 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site M1 was approximately 0.0189 ft/day or 6.9 ft/yr in April (Table 3-7). However, that would indicate that the plume should be on the order of 80 ft from the ash pile after 40 years of travel time (1965 to 2005). In fact, by 2005, the elevated sulfate levels were observed out to MW645, a distance of 2,060 ft, which suggests a flow velocity of approximately 50 ft/yr.

The groundwater flow direction in the bedrock aquifer is generally toward the northwest, as shown on Figure 3-8. An upward vertical gradient was observed at well nest MW351/MW640 and a downward vertical gradient was observed at well nest MW641/MW642 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site M1.

3.3.2 Analytical Results

Groundwater sampling points for Site M1 during spring 2012 are summarized in Table 1-1. The following monitoring wells and the surface water sampling point at M1 are sampled for sulfate:

- In-Plume – MW107, MW231, MW640, MW641, and MW642
- Early Warning – MW643 and MW644
- Compliance – MW646 for the bedrock aquifer and MW645, MW648, and MW649 and surface water sampling point SW709 where the creek leaves the GMZ boundary for the overburden aquifer

Groundwater and surface water samples collected at Site M1 in April were analyzed for sulfate in accordance with Appendix B (QAPP) of the LTM Plan. Sulfate detections for the April sampling event conducted at Site M1 are summarized in Table 3-3 and shown on Figure 3-9. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW107, MW231, MW640, MW641, and MW642): At monitoring well MW107, sulfate exceeded the RG at a concentration of 26,000 mg/L for the April sampling event.

At monitoring well MW231, sulfate exceeded the RG at a concentration of 35,000 mg/L for the April sampling event.

At monitoring well MW640, sulfate exceeded the RG at a concentration of 5,200 mg/L for the April sampling event.

At monitoring well MW641, sulfate exceeded the RG at a concentration of 640 mg/L for the April sampling event.

At monitoring well MW642, sulfate exceeded the RG at a concentration of 420 mg/L for the April sampling event.

Early Warning Wells (MW643 and MW644): At monitoring wells MW643 and MW644, sulfate was detected at concentrations below the RG for the April sampling event.

Compliance Points (MW645, MW646, MW648, MW649, and SW709): At monitoring wells MW645, MW646, MW648, and MW649 and surface water sampling point SW709, sulfate was detected at concentrations below the RG for the April sampling event.

3.3.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M1 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.4 MFG GMZ

The MFG Area is the sixth GMZ, lies in the northwestern part of JOAAP, and was created by the consolidation of several discrete sites including M3, M4, M5, M6, M7, M8, M9, M13, and outlying wells deemed as "Other Areas". The MFG Area GMZ is illustrated on Figure 1-2. Each of these areas hosted unique operations that led to the release of different contaminants. Groundwater contamination consisting of explosive compounds, excluding contamination from Landfill M13, is being managed collectively and is included as Section 3.6. Of the areas, only Sites M6, M9, and M13 continue to have groundwater contamination with COCs in excess of RGs. Each site comprising the MFG GMZ will be independently closed before the MFG GMZ can be eliminated.

Monitoring wells from Sites M6, M7, M9, and Other Areas continue to be included in the MFG groundwater sampling. Numerous monitoring wells are also measured as water level control points at these other sites.

3.4.1 Site M6

Site M6, the TNT Ditch Complex, covers 271 acres to the northwest of Site M5 in the central part of the MFG Area (Figure 1-2) and was largely used for TNT and DNT production during World War II, and then again in the Korean and Vietnam Wars. In between the wars, the facilities were used for research and development of different explosives like nitroxylenes. Production of TNT was terminated in 1977.

Production of TNT was conducted in 12 parallel lines, each containing a full sequence of production steps from the "mono-house" to the "bi-house" and then the "tri-house" buildings. Waste water ("red water") from each "tri-house" and the wash houses was discharged from wooden tanks to clay-lined ditches feeding into the TNT Ditch. In 1965, the original drainage system was replaced by wooden flumes completed in the TNT Ditch and the red water was diverted to Site M7 for treatment. Dintrotoluene production waste water was discharged from wooden tanks into open troughs and ditches that flowed to the storm water sewer system and the TNT Ditch, ultimately flowing untreated into Grant Creek. In addition to normal processing water, the TNT Ditch received drench water used to kill a production run when reactions ran out of control and posed an explosive threat. Between 1972 and 1974, there were more than 30 recorded instances of drenching with the associated discharge of "bi-oil" and concentrated nitric and sulfuric acid.

The full range of nitroaromatic compounds have been found in soil at Site M7, with concentrations of TNT, 2,4-dinitrotoluene (2,4-DNT), lead, arsenic, and beryllium

exceeding their respective RGs. Seven explosive compounds have been observed in the underlying groundwater at concentrations that exceed their respective RGs: TNT, 2,4-DNT, 2,6-DNT, 2-nitrotoluene (2-NT), TNB, nitrobenzene (NB), and RDX.

The overburden aquifer primarily consists of silt and clay, with variable amounts of sand and silty gravel. The overburden thickness ranges from 5 to 30 ft across the site. Based on available information, screens for overburden wells at Site M6 are set in silt and/or clay layers with the exception of monitoring wells MW650 and MW652; which have screens set in a silty gravel layer.

3.4.1.1 Groundwater Hydraulics

The groundwater monitoring network within Site M6 consists of 39 wells: 14 overburden wells, 2 combined overburden/bedrock wells, and 23 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at numerous monitoring wells at M6 and sites including M3, M4, M5, M8, M9, and "Other Areas". Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-10.

The horizontal gradient in the northern part of Site M6 was calculated to be 0.0187 ft/ft and in the southern part of Site M6 was calculated to be 0.0225 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 8.6E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M6 was approximately 0.1674 ft/day or 61.1 ft/yr in April (Table 3-7). However, at Site M6, COCs have not been detected at wells 600 ft directly downgradient (MW212R to MW123R and MW162R). Given the 60 years that have passed since releases began at Site M6, this suggests the transport time for RDX and TNT is less than 600/60 = 10 ft/yr. A rate of 10 ft/yr is comparable to transport rates calculated for other areas of JOAAP.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-11. Screens for bedrock monitoring wells MW123, MW314, MW316, MW318, and MW654 are set at shallow depths (<10 ft below top of bedrock), while screens for monitoring wells MW118, MW119, MW213R, MW215R, MW310R, MW311, MW313, and MW653 are set at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Screens for monitoring wells MW312, MW315, MW317, MW320, MW651, and MW655 are set deeper within the bedrock aquifer (>20 ft below top of bedrock). Vertical gradients were generally downward for well nests located along the escarpment, where the former TNT load lines were oriented at Site M6, and were upward in the wetland immediately to the west in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.4.1.2 Analytical Results

Groundwater sampling points for Site M6 during April 2012 are summarized in Table 1-1. The following monitoring wells at M6 and other sites included in the M6 grouping are sampled for explosives:

- In-Plume – MW212R, MW652, and MW330 (M9)
- Early Warning – MW123R, MW162R, MW313, MW318, MW319, and MW654
- Compliance – MW117 and MW118 and MW119 (Other Areas).

Groundwater samples collected at Site M6 in April were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Monitoring well MW330 was sampled for sulfate. Explosive compound detections for the April sampling event conducted at Site M6 are summarized in Table 3-1 and shown on Figure 3-12. Sulfate detections the April sampling event conducted at Site M6 are summarized in Table 3-3. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW212R, MW652, and MW330): At monitoring well MW212R, 2,4-DNT (620 µg/L), 2,6-DNT (260 µg/L), and TNT (39 µg/L) exceeded the RG for the April sampling event.

At monitoring well MW652, 2,4-DNT (8,400 µg/L), 2,6-DNT (3,300 µg/L), 2-NT (44,000µg/L), and TNT (1,600 µg/L) exceeded the RG for the April sampling event.

At monitoring well MW330, sulfate exceeded the RG at a concentration of 430 µg/L for the April sampling event.

Early Warning Wells (MW123R, MW162R, MW313, MW318, MW319, and MW654): At monitoring wells MW123R, MW162R, and MW313, there were no RG exceedances of explosive compounds for the April sampling event.

At monitoring well MW318, 2,6-DNT exceeded the RG at a concentration of 0.45 ug/L for the April sampling event.

At monitoring well MW319, there were no RG exceedances of explosive compounds for the April sampling event.

At monitoring well MW654, 2,4-DNT exceeded the RG at a concentration of 1.7 ug/L and 2,6-DNT exceeded the RG at a concentration of 0.97 ug/L for the April sampling event. The continued detection of degradation products 2-A-4,6-DNT and 4-A-2,6-DNT in samples collected from monitoring well MW654 indicate contaminant reduction is occurring.

Compliance Wells (MW117 and MW118 and MW119: At monitoring wells MW117, MW118, and MW119, there were no detections of explosive compounds for the April sampling event.

3.4.1.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M6 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.4.2 Site M7

Site M7, the Red Water Area, comprises 49 acres in the central part of the MFG Area between Site M6 and Site M7 on the west bank of the TNT Ditch (Figure 1-2). Facilities at Site M7 included storage tanks, pump stations, evaporators, and incinerators used to destroy the red water from Site M6 after construction in 1965. Overflows of untreated red water were stored in the Red Water Lagoon, a 3.3 acre impoundment that was remediated in 1985.

Contaminants of concern in soil included TNT, 2,4- and 2,6-DNT, TNB, and RDX. Source areas in soil included the drainage areas in the northwest part of Site M7. Soil RA activities were completed in 2001 at Site M7. Contaminants of concern in groundwater include: TNT, 2,4-DNT, 2,6-DNT, and RDX.

The overburden aquifer primarily consists of silt and clay, with some sand and gravel in the upper, unsaturated, part of the aquifer. The overburden thickness ranges from less than 5 to more than 10 ft across Site M7. Based on available information, samples from overburden wells are obtained from discontinuous sand and gravel layers.

3.4.2.1 Groundwater Hydraulics

The groundwater monitoring network at Site M7 consists of 9 wells: 4 overburden wells, 1 combined overburden/bedrock well, and 4 bedrock wells. Water levels are measured at each groundwater location that is sampled (listed below), and at monitoring wells MW156, MW159, MW216, MW217, MW321, MW322, MW660, and MW661. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer in the immediate vicinity of Site M7 is generally toward the west/southwest as shown on Figure 3-10.

The horizontal gradient at Site M7 was calculated to be 0.0105 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 6.7E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M7 was approximately 0.0665 ft/day or 24 ft/yr in April (Table 3-7).

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Site M7 is generally toward the west/northwest as shown on Figure 3-11. With the exception of well MW124R, bedrock wells are screened at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Bedrock well MW124R and combination well MW157 are screened at a shallow depth within bedrock (<10 ft below top of bedrock). Vertical gradients were calculated for well nests MW216/MW217, MW660/MW661, MW321/MW322, and MW157/MW158 located in the vicinity of Site M7. Calculated vertical gradients were downward at well nests MW321/MW322 and MW660/MW661, upward at well nest MW216/MW217 (located slightly north), and a very low vertical gradient was observed at well nest MW157/MW158 (located in the wetland west of the escarpment) (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.4.2.2 Analytical Results

Monitoring well MW124R was sampled during April as an early warning bedrock well as part of the MFG monitoring network (Table 1-1).

The groundwater samples collected at Site M7 in 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for the April sampling event conducted at Site M7 are summarized in Table 3-1 and shown on Figure 3-12. A brief discussion of analytical results by well type follows.

Early Warning Well (MW124R): At well MW124R, there were no detections of explosive compounds for the April sampling event.

3.4.2.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M7 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.5 LANDFILL M11

Landfill M11 is located in the southwestern part of the manufacturing side of JOAAP as illustrated on Figures 1-2. The landfill monitoring area comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model (CSM) is that M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill, thus preventing groundwater contamination.

Monitoring at Landfill M11 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures for the first five years, then annually for 25 years. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future;

3.5.1 Groundwater Hydraulics

The groundwater monitoring well network at Landfill M11 consists of 13 wells: 3 combination overburden/bedrock wells and 10 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells MW108, MW337, MW338, MW339, and MW340. Monitoring well information and water levels for April are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-13.

The horizontal gradient at Landfill M11 was 0.0052 ft/ft in April (Table 3-6). Using a hydraulic conductivity of 6.7E-04 cm/sec from nearby Site M7 and an assumed porosity of 0.30, the calculated flow velocity at Landfill M11 was approximately 0.0329 ft/day or 12 ft/yr in April (Table 3-7).

Bedrock is shallow at Landfill M11, ranging from 2.5 to 9 ft below ground surface. The groundwater flow direction in the bedrock aquifer is generally toward the northwest as shown on Figure 3-14. The calculated vertical gradients were upward at upgradient well nest MW802/MW803 and downward at downgradient well nest MW804/MW805 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.5.2 Analytical Results

Groundwater sampling points for Landfill M11 during spring 2012 are summarized in Table 1-1. The following monitoring wells at Landfill M11 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient – MW802
- Downgradient – MW335, MW336, and MW805

Groundwater samples collected at Landfill M11 in April and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Site M11 in April are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-15. Site M11 monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient (MW802): There were no detections for explosive compounds for the April sampling event.

There were no RG exceedances for metals for the April sampling event.

There were no RG exceedances for nitrate or sulfate for the April sampling event.

There were no detections of VOCs for the April sampling event.

There were no detections of SVOCs for the April sampling event.

Downgradient (MW335, MW336, and MW805): There were no RG exceedances for explosive compounds for the April sampling event.

There were no RG exceedances for metals for the April sampling event.

There were no RG exceedances for nitrate for the April sampling event. There were RG exceedances for sulfate in the samples collected from monitoring wells MW335 (660 mg/L), MW336 (410 mg/L), and MW805 (470 mg/L) for the April sampling event.

There were no detections of VOCs for the April sampling event.

There were no detections of SVOCs for the April sampling event.

3.5.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Landfill M11 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.6 LANDFILL M13

Landfill M13 comprises approximately 106 acres of the central part of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area (Figure 1-2).

Landfill M13 is located in the northern part of Site M13 and comprises approximately 10.5 acres. Site features at Landfill M13 and surrounding areas are illustrated on Figure 3-16. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfilling took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. Other waste management activities at Site M13 involved explosives. Explosive compounds observed in the groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. On a single occasion in 1991, antimony and cadmium were reported to be present in groundwater samples at concentrations in excess of their respective RGs, but they have not exceeded the RGs since. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current CSM is that metals and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

The Northern Gravel Pit was consolidated and capped (Landfill M13) in the 2007 to 2008 time frame. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

With the implementation of the RA at the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

Monitoring at Landfill M13 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 15 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future;
- Ensure the fence and signage installed to restrict site access remain in place and serviceable; and
- Certify that institutional controls remain in place.

The overburden aquifer primarily consists of silt and clay, with abundant sand and gravel in the upper, unsaturated, portion of the aquifer. The overburden thickness is approximately 25 ft and is fairly consistent across Site M13. Samples from overburden wells are obtained from silt and/or clay layers.

3.6.1 Groundwater Hydraulics

The groundwater monitoring network at Landfill M13 consists of 11 wells: 6 overburden wells, 1 combined overburden/bedrock well and 4 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells MW350, MW363, and MW364. Monitoring well information and water levels for February and April are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer for the February and April quarterly sampling events is to the south/southeast as shown on Figures 3-16 and 3-17, respectively. Figure 3-17 includes the surrounding groundwater flow taken from the semi-annual sampling event, as shown on Figure 3-10.

The horizontal gradient at Site M13 was calculated to be 0.0048 ft/ft in February and 0.0047 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 8.0E-02 cm/sec and an assumed porosity of 0.30, the calculated flow velocity at Site M13 was approximately 3.6 ft/day or 1,296 ft/yr in February and in April (Table 3-7). Chemical data do not support this high of a flow velocity and linear flow velocities are likely on the order of 10 ft/yr based on data from other sites at JOAAP.

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Landfill M13 for February and April quarterly sampling events was generally toward the southwest as shown on Figures 3-18 and 3-19. Figure 3-19 includes the surrounding groundwater

flow taken from the April semi-annual sampling event, as shown on Figure 3-11. The screens for combination well MW350 and nearby bedrock well MW321 are set at a shallow depth within the bedrock aquifer (<10 ft below top of bedrock), while the well screen for nearby well MW322 is set at an intermediate depth within the bedrock aquifer (10 to 20 ft below top of bedrock). Downward vertical gradients were observed at upgradient well nest MW806/MW807 in February and April and downgradient well nests MW363/MW364 in February and MW808/MW809 in February and April. An upward vertical gradient was observed at downgradient well nests MW126R/MW362 in February and April and MW363/MW364 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.6.2 Analytical Results

Groundwater sampling points for Landfill M13 within the MFG GMZ for the spring 2012 sampling events (quarterly) are summarized in Table 2-1. Monitoring wells AEHA14R and AEHA15 were not sampled in Spring 2012 as recommended in the 2010 Annual Report. The following monitoring wells at Landfill M13 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient – MW806 and MW807
- Downgradient – MW126R, MW362, MW808, and MW809

Groundwater samples were collected at Landfill M13 in February and April, 2012 and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections of explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Landfill M13 in spring 2012 are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-20. For Landfill M13 the monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient (MW806 and MW807): There were no detections of explosive compounds for the February or April sampling events.

There were no RG exceedances for metals for the February or April sampling events.

There were no RG exceedances for nitrate or sulfate for the February or April sampling events.

There were no RG exceedances for VOCs for the February or April sampling events. However, at monitoring well MW807, carbon disulfide (2.4 ug/L), 1,1-DCA (1.4 µg/L), and cis-1,2-DCE (0.79 µg/L) were detected below their respective RGs.

There were no detections of SVOCs for the February or April sampling events.

Downgradient (AEHA14R, AEHA15, MW126R, MW362, MW808, and MW809): There were no detections of explosive compounds at monitoring wells MW808, or MW809 for the February or April sampling events. At monitoring well MW126R, 2-NT and 4-NT were detected below their respective RGs for the April sampling event.

At monitoring well MW362, 2,4-DNT exceeded the RG for the February (1.5 ug/L) and April (4.9 ug/L) sampling events and 2-NT and 3-NT were detected at concentrations below their respective RGs for the April sampling event. In addition, TNT degradation products 2-A-4,6-DNT and 4-A-2,6-DNT were also detected at MW362 at low concentrations for the February and April sampling events.

At monitoring well AEHA15, iron was detected above the RG at a concentration of 15 mg/L for the February sampling event.

There were no RG exceedances for nitrate or sulfate for the February or April sampling events.

At monitoring well MW126R, trichloroethene was detected at a concentration of 0.23 ug/L below the RG for the April sampling event.

At monitoring well MW362, 2,4-DNT was not detected in February as it was in the explosives analysis, but exceeded the RG at a concentration of 3.3 ug/L in April which confirmed the exceedance in the explosives analysis.

3.6.3 Recommendations

Sampling at Landfill M13 should be performed during quarterly summer and fall 2012 sampling events as outlined in Table 3-9. An evaluation of the 2,4-DNT exceedances detected at monitoring well MW362 will be completed in the 2012 Annual Groundwater Monitoring Report to include analytical data from the remaining 2012 quarterly sampling events. A monitoring well should be installed downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15.

4.0 SUMMARY OF RECOMMENDATIONS

Recommendations included in previous LTM Plan reports relevant to modifications to the Long-Term Monitoring Program are summarized in Table 4-1. The following presents additional recommendations.

- The monitoring program as outlined in Table 3-9 should be implemented for the Fall 2012 sampling event.

- At Landfill L3 the rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair.

- A monitoring well should be installed downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15.

- Required monitoring well repairs summarized in Section 2.1.2 will be completed during the fall 2012 sampling round.

5.0 REFERENCES

Aerostar Environmental Services, Inc. 2009. *Second Five-Year Review Report for the Groundwater Operable Unit, Joliet Army Ammunition Plant,* prepared for the U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky, August 2009.

Aerostar Environmental Services, Inc. 2009. *Second Five-Year Review Report for the Soil Operable Unit, Joliet Army Ammunition Plant,* prepared for the U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky, August 2009.

Cookson, John T., 1995. Bioremediation Engineering: Design and Application, McGraw-Hill, Inc.

Gorontzy, T., O. Drzyzga, M.W. Kahl, D. Bruns-Nagel, J. Breitung, E. von Loew, and K.H. Blotevogel, 1994. Microbial Degradation of Explosives and Related Compounds in Critical Reviews in Microbiology, 20(4), CRC Press, Boca Raton, FL.

Haigler, B.E. and J.C. Spain, 1996. Degradation of Nitroaromatic Compounds by Microbes in the Society for Industrial Microbiology News, 46(2), Society for Industrial Microbiology, Fairfax, VA.

Kaplan, D.L., 1993. Biotechnology and Bioremediation in Organic Energetic Compounds, ed. Paul L. Marinkas, Nova Science Publishers, NY, NY.

Rifai, H.S., Borden, R.C., Wilson, J.T. and C.H. Ward. 1995. *Intrinsic Bioattenuation for Subsurface Restoration.* In: Intrinsic Bioremediation, ed. R.E. Hinchee, J.T. Wilson, and D.C. Downey, 1-29. Columbus, OH: Battelle Press.

TolTest/MWH, 2010. *Final Long-term Monitoring Plan for Environmental Remediation Services, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, March 2010.

TolTest/MWH, 2011. *Final 2009 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, September 2011.

TolTest/MWH, 2011. *Final 2009 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, September 2011.

TolTest/MWH, 2011. *Final 2010 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, December 2011.

TolTest/MWH, 2012. *Final 2010 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, May 2012.

TolTest/MWH, 2012. *Final 2011 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, June 2012.

TolTest/MWH, 2013. *Final 2011 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, January 2013.

U.S. Army, 1998. *Final Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas, National Priority List Sites, Joliet Army Ammunition Plant, Wilmington, Will County, Illinois*, October 1998.

Wiedemeier, T.H., 1995. *Technical Protocol for Implementing Intrinsic Remediation with Long-term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater*, Vol. I and II, prepared for Air Force Center for Environmental Excellence, Technology Transfer Division, Brooks Air Force Base, San Antonio, Texas.

Wiedemeier, T.H., Swanson, M.A., Moutoux, D.E., Wilson, J.T. Kampbell, D.H., Hansen, J.E., and P. Haas, 1996. *Overview of the Technical Protocol for Natural Attenuation of Chlorinated Aliphatic Hydrocarbons in Ground Water Under Development for the U.S. Air Force Center for Environmental Excellence.* In: U.S. EPA Symposium on Natural Attenuation of Chlorinated Organics in Ground Water. EPA/540/R-96/509. Washington, DC.

TABLES

TABLE 1-1

Spring 2012 Sample Parameters
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Well ID	Parameter
L1	***In-plume***	
	MW131	E
	MW173	E
	WES1	E
	Early Warning	
	WES3	E
	MW174	E
	Compliance	
	SW550	E
L3/ Landfill L3	***Upgradient***	
	SW004	E, M
	In-plume/Downgradient	
	MW410	E
	MW412	E, M
	Early Warning/Downgradient	
	MW630	E, M
	MW631	E, M
	MW633	E, M
	Compliance/Downgradient	
	SW777	E, M
	Downgradient	
	SW557	E, M
	SW558	E, M
M1	***In-plume***	
	MW107	S
	MW231	S
	MW640	S
	MW641	S
	MW642	S
	Early Warning	
	MW643	S
	MW644	S
	Compliance	
	MW645	S
	MW646	S
	MW648	S
	MW649	S
	SW709	S
MFG	***In-plume***	
	MW212R	E
	MW330	S
	MW652	E
	Early Warning	
	MW123R	E
	MW124R	E
	MW162R	E
	MW313	E
	MW318	E
	MW319	E
	MW654	E
	Compliance	
	MW117	E
	MW118	E
	MW119	E
Landfill M11	***Upgradient***	
	MW802	E, I, M, SVOC & V
	Downgradient	
	MW335	E, I, M, SVOC & V
	MW336	E, I, M, SVOC & V
	MW805	E, I, M, SVOC & V
Landfill M13(1)	***Upgradient***	
	MW806	E, I, M, SVOC & V
	MW807	E, I, M, SVOC & V
	Downgradient	
	MW126R	E, I, M, SVOC & V
	MW362	E, I, M, SVOC & V
	MW808	E, I, M, SVOC & V
	MW809	E, I, M, SVOC & V

General Notes:
E - Explosives
M - Metals
S - Sulfate
MFG - Manufacturing Area
I - Indicator parameters (Nitrate-N and Sulfate)
SVOC - Semivolatile Organic Compounds
V - Volatile Organic Compounds (VOCs)

Footnotes:
(1) Site M13 Landfill monitoring wells were also sampled quarterly in February for these parameters in compliance with Illinois Administrative Code, including wells AEHA14R and AEHA15.

Table 2-1

Final Field Stabilization Parameters
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Well ID	Sample Date	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)
L1	***In-plume***							
	MW131	4/12/2012	7.06	1160	0.2	8.03	9.7	190
	MW173	4/11/2012	7.34	811	0.4	4.58	9.0	89
	MW174	4/11/2012	7.32	823	0.4	2.77	8.4	-18
	WES1	4/12/2012	7.31	839	0.0	6.77	12.8	179
	Early Warning							
	WES3	4/11/2012	7.20	775	0.0	0.39	13.2	140
	Compliance							
	SW550	4/14/2012	7.67	899	Moderate	15.61	10.4	12.3
L3	***Upgradient***							
	SW004	4/10/2012	8.00	720	Moderate	10.39	14.5	176
	In-plume/Downgradient							
	MW410	4/11/2012	7.57	940	12.8	2.31	11.2	115
	MW412	4/11/2012	7.41	819	10.4	6.14	8.4	139
	Early wWarning/Downgradient							
	MW630	4/11/2012	7.42	766	3.6	6.90	8.8	113
	MW631	4/11/2012	7.53	692	7.1	0.95	9.6	157
	MW633	4/11/2012	7.53	677	9.2	3.54	8.8	135
	Compliance/Downgradient							
	SW777	4/11/2012	8.31	692	Moderate	11.14	13.7	124
	Downgradient							
	SW557	4/10/2012	8.34	710	Moderate	10.05	14.5	149
	SW558	4/10/2012	8.67	682	Slight to Clear	10.97	9.5	148
M1	***In-plume***							
	MW107	4/12/2012	9.76	4790	3.3	0.59	11.4	-122
	MW231	4/12/2012	9.40	5940	0.0	0.38	10.3	-158
	MW640	4/12/2012	6.90	9360	6.1	2.54	11.4	-63
	MW641	4/12/2012	7.37	2300	6.9	2.92	9.8	-100
	MW642	4/12/2012	7.47	1500	2.6	1.96	10.4	28
	Early Warning							
	MW643	4/13/2012	7.65	839	5.5	8.70	10.1	-47
	MW644	4/13/2012	7.70	1090	0.0	3.41	10.0	130
	Compliance							
	MW645	4/13/2012	7.44	839	1.3	2.22	9.5	108
	MW646	4/13/2012	7.76	903	0.8	4.13	9.9	115
	MW648	4/12/2012	7.62	643	25.9	0.75	9.7	-122
	MW649	4/13/2012	7.60	684	0.4	1.54	10.0	85
	SW709	4/13/2012	7.01	750	Moderate	11.11	12.0	14.1
MFG	***In-plume***							
	MW212R	4/15/2012	7.51	753	2.1	6.90	10.8	83
	MW330	4/17/2012	7.30	1370	13.5	5.39	12.6	125
	MW652	4/14/2012	7.23	1290	0.0	0.95	9.8	43
	Early Warning							
	MW123R	4/14/2012	6.97	1240	2.3	0.23	11.2	-60
	MW124R	4/14/2012	7.07	713	9.1	0.00	9.9	-70
	MW162R	4/14/2012	7.07	1140	0.0	2.00	11.1	0
	MW313	4/15/2012	7.77	1020	0.0	0.34	14.5	55
	MW318	4/14/2012	7.36	1230	0.1	0.00	10.4	-107
	MW319	4/14/2012	7.55	1330	0.7	1.94	11.5	-45
	MW654	4/15/2012	7.54	1980	0.0	1.79	11.0	60
	Compliance							
	MW117	4/13/2012	7.08	950	1.7	7.11	10.3	-113
	MW118	4/13/2012	7.58	742	1.2	1.75	9.8	97
	MW119	4/13/2012	7.28	1910	4.6	0.00	9.8	70

Table 2-1

Final Field Stabilization Parameters
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Well ID	Sample Date	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)
Landfill M11	***Upgradient***							
	MW802	4/16/2012	7.51	741	2.6	0.84	10.0	-6
	Downgradient							
	MW335	4/16/2012	7.61	1890	1.1	4.35	9.1	121
	MW336	4/16/2012	7.60	1400	4.2	2.31	9.3	88
	MW805	4/16/2012	7.77	1510	10.3	3.95	10.3	95
Landfill M13	***Upgradient***							
	MW806	2/29/2012	7.71	751	21.1	5.23	11.7	-43
		4/16/2012	7.66	838	0.0	0.99	11.9	61
	MW807	2/29/2012	7.53	3610	0.0.	0.93	11.9	-163
		4/16/2012	7.27	3790	0.0	0.38	13.4	-104
	Downgradient							
	AEHA14R	3/1/2012	NM	NM	NM	NM	NM	NM
	AEHA15	3/1/2012	NM	NM	NM	NM	NM	NM
	MW126R	2/29/2012	7.50	1111	18.3	4.11	10.6	37
		4/16/2012	7.41	792	0.0	0.67	12.2	29
	MW362	2/29/2012	7.60	3028	12.0	3.16	11.8	67
		4/16/2012	7.35	2860	0.7	3.81	12.4	108
	MW808	2/29/2012	7.00	1635	10.6	2.11	11.6	-78
		4/16/2012	7.16	1430	3.2	4.09	10.4	-52
	MW809	2/29/2012	7.95	623	10.0	5.00	11.8	-165
		4/16/2012	7.83	536	1.3	5.36	12.0	-59

General Notes:
ID = identification
SU = standard units
mS/cm = microsiemens per centimeter
NTU = nephelometric turbidity unit
mg/L = milligrams per liter
°C = degrees Centigrade
mV = millivolt
R = Replacement well
NM = not measured
Redox = reduction/oxidation potential
Wells AEHA14R and AEHA15 were not able to be purged prior to collecting a sample. Therefore stabilization criteria were not measured.

TABLE 2-2

Monitoring Well Information - Manufacturing Area
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW104	M1	15019989.44	1318790.51	549.10	546.20	7.0	27.0	30.0	NM	NM	6.05	543.05	27.00	519.20	1981	OVB	20.0	4.0
MW105		15020111.69	1320854.13	555.00	552.50	7.0	27.0	29.9	NM	NM	6.01	548.99	24.00	528.50	1981	COMBO	20.0	4.0
MW106		15020948.76	1318761.26	542.00	539.70	10.0	30.0	32.0	NM	NM	3.60	538.40	21.00	518.70	1981	COMBO	20.0	4.0
MW107		15021094.20	1320422.28	552.40	549.10	5.5	25.5	27.4	NM	NM	6.06	546.34	17.00	532.10	1981	COMBO	20.0	4.0
MW201		15020020.57	1318931.61	546.15	544.01	46.5	66.5	70.5	NM	NM	2.88	NM	24.00	520.01	1988	BRK	20.0	4.0
MW231		15020828.13	1319861.02	550.33	548.47	6.0	16.0	15.7	NM	NM	3.99	546.34	16.00	532.47	1988	OVB	10.0	4.0
MW347		15020481.00	1319594.96	551.73	549.84	14.4	24.4	27.0	NM	NM	4.81	NM	18.50	531.34	1991	COMBO	10.0	4.0
MW351		15021257.77	1319798.88	548.38	545.68	9.5	19.5	22.7	NM	NM	4.91	543.47	22.50	523.18	1991	OVB	10.0	4.0
MW640		15021244.24	1319804.02	548.12	545.40	29.0	39.0	40.0	NM	NM	3.95	544.17	23.00	522.40	1999	BRK	10.0	4.0
MW641		15021873.45	1319350.19	544.50	541.98	7.0	17.0	17.2	NM	NM	2.22	542.28	29.00	516.08	1999	OVB	10.0	4.0
MW642		15021874.37	1319339.91	544.47	541.95	29.0	39.0	40.0	NM	NM	2.75	541.72	29.00	516.08	1999	OVB	10.0	4.0
MW643		15022117.67	1318719.85	540.03	537.55	4.3	7.2	7.8	NM	NM	6.73	533.30	7.25	530.30	2001	OVB	2.9	4.0
MW644		15022128.91	1318718.61	540.23	537.55	10.8	20.4	21.0	NM	NM	6.22	534.01	7.25	530.30	2001	BRK	9.6	4.0
MW645		15022269.11	1318648.69	541.47	538.90	7.5	11.5	12.0	NM	NM	8.53	532.94	10.50	528.40	2001	OVB	4.0	4.0
MW646		15022257.26	1318650.53	541.48	539.09	12.3	21.9	22.5	NM	NM	8.49	532.99	10.50	528.59	2001	BRK	9.6	4.0
MW647		15022572.85	1318012.98	538.40	535.96	7.3	16.9	17.5	NM	NM	5.69	532.71	6.00	529.96	2001	OVB	9.6	4.0
MW648		15022428.25	1319438.13	546.77	544.17	7.3	16.8	17.4	NM	NM	6.03	540.74	13.50	530.67	2001	OVB	9.6	4.0
MW649		15021299.49	1318723.15	543.10	540.49	7.0	16.6	17.2	NM	NM	7.24	535.86	7.50	532.99	2001	OVB	9.6	4.0
MW111	M3	15028902.95	1318551.57	531.80	529.40	10.5	54.0	UNKNOWN	NM	NM	NM	NM	10.00	519.40	1981	BRK	43.5	4.0
MW112		15030353.67	1318557.88	534.10	531.70	7.2	27.2	UNKNOWN	NM	NM	NM	NM	8.00	523.70	1981	BRK	20.0	4.0
MW113		15030379.46	1319676.13	536.32	533.70	7.2	27.2	UNKNOWN	NM	NM	6.0	530.30	5.00	528.70	1981	BRK	20.0	4.0
MW154		15027749.55	1318572.52	533.06	529.15	5.5	9.1	UNKNOWN	NM	NM	NM	NM	8.00	521.15	1982	BRK	3.6	UNKNOWN
MW203		15029235.44	1318551.15	534.23	532.02	10.5	25.5	UNKNOWN	NM	NM	NM	NM	5.50	526.52	1988	BRK	15.0	4.0
MW232		15030123.95	1318974.36	535.79	533.38	20.0	35.0	UNKNOWN	NM	NM	NM	NM	7.00	526.38	1988	BRK	15.0	4.0
MW233		15029737.88	1319024.94	535.58	532.96	10.0	25.0	UNKNOWN	NM	NM	NM	NM	2.50	530.46	1988	BRK	15.0	4.0
MW348		15029911.26	1318978.02	535.71	532.61	16.5	31.5	UNKNOWN	NM	NM	NM	NM	3.00	529.61	1991	BRK	15.0	4.0
MW352		15029602.85	1318617.32	534.89	532.33	19.0	34.0	UNKNOWN	NM	NM	NM	NM	6.00	526.33	1991	BRK	15.0	4.0
MW353		15030120.63	1318562.29	534.64	531.86	17.0	32.0	UNKNOWN	NM	NM	NM	NM	2.00	529.86	1991	BRK	15.0	4.0
MW115	MFG	15032589.49	1318485.27	533.40	530.80	7.2	27.2	UNKNOWN	NM	NM	4.59	528.81	2.00	528.80	1981	BRK	20.0	4.0
MW157	(M4)	15032947.33	1319827.02	535.02	531.37	3.7	10.2	UNKNOWN	NM	NM	4.68	530.34	11.00	520.37	1982	COMBO	6.5	2.0
MW158		15032970.89	1319820.01	534.40	531.58	9.0	29.5	31.9	NM	NM	4.06	530.34	5.00	526.58	1982	BRK	20.5	3.0
MW114R	MFG	15031315.26	1323651.56	556.80	554.9	6.5	21.5	22.0	NM	NM	NM	NM	15.00	539.90	2001	COMBO	15.0	4.0
MW127R	(M5)	15032537.25	1326273.84	596.04	592.9	30.0	45.0	46.0	NM	NM	42.29	553.75	40.00	552.90	2001	COMBO	15.0	4.0
MW207R		15032188.92	1323779.72	560.21	557.5	7.0	17.0	18.0	NM	NM	NM	NM	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW354R		15031780.18	1323424.19	559.61	557.6	7.0	17.0	18.0	NM	NM	13.69	545.92	19.00	538.60	2001	COMBO	10.0	4.0
MW355R		15030827.10	1323676.76	558.12	555.7	10.0	20.0	22.0	NM	NM	NM	NM	15.00	540.70	2001	COMBO	10.0	4.0
MW356R		15031372.45	1322053.98	558.08	556.1	24.5	34.5	35.0	NM	NM	16.05	542.03	20.00	536.10	2001	BRK	10.0	4.0
MW117	MFG	15036450.18	1318407.67	529.10	526.90	7.7	27.7	UNKNOWN	NM	NM	4.75	524.35	12.00	514.90	1981	COMBO	20.0	4.0
MW122	(M6)	15038443.33	1321304.96	540.10	537.40	7.0	27.0	UNKNOWN	NM	NM	4.60	535.50	6.50	530.90	1981	BRK	20.0	4.0
MW123R		15035314.93	1320626.07	537.22	534.9	15.0	30.0	32.0	NM	NM	5.48	531.74	10.00	524.90	2001	BRK	15.0	4.0
MW125R		15037201.55	1322981.58	567.69	565.1	12.0	32.0	33.0	NM	NM	14.27	553.42	26.00	539.10	2001	COMBO	20.0	4.0
MW160		15034274.88	1321203.86	542.29	538.20	3.3	6.3	10.4	NM	NM	6.83	535.46	6.00	532.20	1982	OVB	3.0	2.0
MW162R		15035325.72	1320625.78	540.19	537.7	4.5	9.5	10.0	NM	NM	5.41	534.78	UNKNOWN	UNKNOWN	2001	OVB	5.0	4.0
MW164		15037035.66	1321868.53	545.21	541.69	3.0	6.0	9.7	NM	NM	6.49	538.72	6.00	535.69	1982	OVB	3.0	4.0
MW165		15037644.18	1321700.33	544.01	540.31	2.8	5.3	9.0	NM	NM	5.80	538.21	5.00	535.31	1982	OVB	2.5	4.0
MW166R		15039129.45	1322674.99	558.21	555.6	10.0	20.0	21.0	NM	NM	13.70	544.51	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW208		15035028.45	1320126.91	538.38	535.10	12.0	27.0	30.1	NM	NM	5.91	532.47	4.00	531.10	1988	BRK	15.0	4.0
MW209		15037473.35	1320271.28	537.75	534.89	19.5	34.5	UNKNOWN	NM	NM	4.37	533.38	11.10	523.79	1988	BRK	15.0	4.0
MW210R		15035465.00	1322154.00	565.83	564.30	10.7	20.0	20.0	NM	NM	10.74	555.09	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW212R		15035415.00	1321862.00	567.74	565.30	9.5	19.5	21.0	NM	NM	14.74	553.00	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW213R		15035462.00	1322159.00	566.49	564.30	38.0	53.0	54.0	NM	NM	19.47	547.02	30.50	533.80	1998	BRK	15.0	4.0

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Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW215R	MFG	15035410.00	1321863.00	567.27	565.30	38.5	53.5	54.5	NM	NM	21.12	546.15	30.00	535.30	1998	BRK	15.0	4.0
MW307	(M6)	15033821.00	1321855.79	563.56	561.45	17.0	27.0	31.7	NM	NM	19.55	544.01	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW308		15033810.75	1321837.62	563.84	561.38	50.5	65.5	71.8	NM	NM	21.58	542.26	35.00	526.38	1991	BRK	15.0	4.0
MW309		15034826.80	1321825.25	565.59	563.43	12.7	27.7	30.6	NM	NM	11.26	554.33	30.00	533.43	1991	OVB	15.0	4.0
MW310R		15034823.00	1321824.00	565.17	563.00	44.5	59.5	60.0	NM	NM	22.06	543.11	31.00	532.00	1998	BRK	15.0	4.0
MW311		15038100.41	1322342.54	548.85	546.36	14.0	24.0	26.4	NM	NM	1.31	547.54	7.00	539.36	1991	BRK	10.0	4.0
MW312	MFG	15038100.56	1322332.55	548.59	545.96	40.0	55.0	58.1	NM	NM	1.04	547.55	7.00	538.96	1991	BRK	15.0	4.0
MW313	(M6)	15037051.68	1321933.96	551.07	549.20	25.0	40.0	40.9	NM	NM	12.03	539.04	12.00	537.20	1991	BRK	15.0	4.0
MW314		15034383.61	1321451.49	542.32	539.53	9.7	14.7	17.8	NM	NM	6.90	535.42	7.20	532.33	1991	BRK	5.0	4.0
MW315		15034394.61	1321451.65	541.60	538.91	29.7	44.7	47.9	NM	NM	6.19	535.41	6.50	532.41	1991	BRK	15.0	4.0
MW316		15036232.25	1321257.09	542.89	540.49	13.0	18.0	20.9	NM	NM	6.15	536.74	7.50	532.99	1991	BRK	5.0	4.0
MW317		15036222.43	1321257.70	542.96	540.71	34.0	49.0	UNKNOWN	NM	NM	6.68	536.28	8.00	532.71	1991	BRK	15.0	4.0
MW318		15037189.67	1321488.64	547.67	545.23	11.8	21.8	24.2	NM	NM	10.12	537.55	11.50	533.73	1991	BRK	10.0	4.0
MW319		15037202.65	1321489.84	548.10	545.49	40.0	55.0	57.0	NM	NM	10.43	537.67	12.00	533.49	1991	BRK	15.0	4.0
MW320R		15039129.65	1322656.01	557.09	554.6	30.5	45.5	46.0	NM	NM	12.46	544.63	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW650		15037950.23	1322587.98	566.45	563.83	12.0	22.0	22.5	NM	NM	10.84	555.61	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW651		15037939.17	1322583.70	566.88	563.83	36.0	46.0	47.0	NM	NM	18.29	548.59	23.00	560.83	1999	BRK	10.0	4.0
MW652		15037004.90	1322243.13	565.03	561.93	11.0	21.0	22.0	NM	NM	11.31	553.72	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW653		15036994.58	1322239.14	564.60	561.93	36.0	46.0	47.0	NM	NM	17.69	546.91	25.00	536.93	1999	BRK	10.0	4.0
MW654		15037070.77	1321976.938.79	551.15	548.49	13.0	23.0	24.0	NM	NM	12.55	538.60	10.50	539.00	1999	BRK	10.0	4.0
MW655		15034232.30	1320633.23	540.19	537.71	UNKNOWN	UNKNOWN	UNKNOWN	NM	NM	7.46	532.73	5.00	532.70	1999	BRK	UNKNOWN	4.0
MW662		15039862.64	1321841.47	547.56	UNKNOWN	6.0	16.0	18.0	NM	NM	9.15	538.41	20.00	UNKNOWN	2001	OVB	10.0	4.0
MW663		15039854.92	1321841.41	547.86	UNKNOWN	30.0	40.0	41.0	NM	NM	9.31	538.55	20.00	UNKNOWN	2001	BRK	10.0	4.0
MW664		15040136.57	1322326.42	547.43	UNKNOWN	5.0	10.0	10.5	NM	NM	8.62	538.81	10.00	UNKNOWN	2001	OVB	5.0	4.0
MW665		15040145.71	1322327.45	546.98	UNKNOWN	28.0	38.0	40.0	NM	NM	4.94	542.04	10.00	UNKNOWN	2001	BRK	10.0	4.0
MW124R	MFG	15033133.00	1320756.00	537.25	534.70	6.0	16.0	16.0	NM	NM	2.90	534.35	5.00	UNKNOWN	1998	BRK	10.0	4.0
MW156	(M7)	15032408.65	1321713.49	541.35	537.45	1.7	5.2	UNKNOWN	NM	NM	5.84	535.51	5.30	532.15	1982	OVB	3.5	4.0
MW159		15033457.92	1320537.11	537.80	533.54	4.4	9.4	12.8	NM	NM	6.62	531.18	5.70	527.84	1982	COMBO	5.0	4.0
MW216		15033525.60	1320650.62	538.03	536.51	5.0	10.0	36.7	NM	NM	6.60	531.43	11.00	525.51	1988	OVB	5.0	4.0
MW217		15033449.66	1320652.62	538.97	536.90	19.5	34.5	12.0	NM	NM	7.03	531.94	13.40	523.50	1988	BRK	15.0	4.0
MW321		15033167.53	1321626.52	545.55	542.93	13.5	23.5	26.6	NM	NM	7.82	537.73	9.50	533.43	1991	BRK	10.0	4.0
MW322		15033161.04	1321640.23	544.54	542.26	34.5	49.5	51.5	NM	NM	10.75	533.79	9.00	533.26	1991	BRK	15.0	4.0
MW660		15032597.24	1320677.38	539.73	537.08	7.0	12.0	12.6	NM	NM	5.85	533.88	UNKNOWN	UNKNOWN	1999	OVB	5.0	4.0
MW661		15032587.16	1320679.22	539.57	537.09	20.0	30.0	30.0	NM	NM	6.75	532.82	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW147R	MFG	15037926.87	1323318.04	567.82	564.0	6.5	21.5	22.0	NM	NM	11.42	556.40	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW148R	(M8)	15038954.52	1323542.19	561.59	560.7	8.0	23.0	23.5	NM	NM	15.90	545.69	18.00	542.70	2001	COMBO	15.0	4.0
MW323R		15036514.75	1323739.67	566.00	563.5	8.0	18.0	18.5	NM	NM	1.88	564.12	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW324R		15038125.44	1323502.88	566.23	562.7	9.5	19.5	20.0	NM	NM	15.78	550.45	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW325R		15036105.38	1322633.31	569.62	566.9	7.0	17.0	18.0	NM	NM	13.77	555.85	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW327R		15035974.93	1324366.55	565.27	562.57	13.5	18.5	19.0	NM	NM	12.31	552.96	17.00	UNKNOWN	2001	COMBO	5.0	4.0
MW121	MFG	15040140.83	1323725.54	575.75	572.50	10.0	30.0	14.2	NM	NM	18.92	556.83	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW328	(M9)	15040352.78	1323793.00	582.93	580.72	18.0	28.0	19.7	NM	NM	24.68	558.25	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW330		15040218.36	1323970.19	580.33	578.20	15.0	25.0	17.0	NM	NM	22.35	557.98	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW116	MFG	15034538.62	1318460.26	535.20	532.60	7.0	27.0	UNKNOWN	NM	NM	6.33	528.87	5.00	527.60	1981	BRK	20.0	4.0
MW118	(Other Areas)	15039343.51	1318362.19	534.00	531.20	8.0	23.0	UNKNOWN	NM	NM	3.71	530.29	2.50	528.70	1981	BRK	15.0	4.0
MW119		15040962.12	1320127.86	538.90	535.50	3.3	23.3	UNKNOWN	NM	NM	6.21	532.69	6.00	529.50	1981	BRK	20.0	4.0
MW108	M11	15025248.13	1320261.16	543.60	540.80	7.0	27.0	UNKNOWN	NM	NM	7.97	535.63	9.00	531.80	1981	BRK	20.0	4.0
MW333		15026529.41	1319776.92	536.41	533.63	17.9	32.9	UNKNOWN	NM	NM	2.78	533.63	5.00	528.63	1991	BRK	15.0	4.0
MW334		15025998.41	1319521.79	536.22	533.40	19.0	34.0	UNKNOWN	NM	NM	3.41	532.81	5.00	528.40	1991	BRK	15.0	4.0
MW335		15025671.86	1319364.79	538.36	535.66	9.4	19.4	UNKNOWN	NM	NM	6.11	532.25	6.00	529.66	1991	BRK	10.0	4.0
MW336		15025322.08	1319223.43	537.28	534.79	12.0	22.0	UNKNOWN	NM	NM	7.65	529.63	7.50	527.29	1991	BRK	10.0	4.0
MW337		15024991.97	1319103.37	536.96	534.32	21.1	36.1	UNKNOWN	NM	NM	5.71	531.25	6.50	527.82	1991	BRK	15.0	4.0

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Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW338	M11	15024414.06	1318777.52	537.73	534.70	13.5	28.5	UNKNOWN	NM	NM	5.28	532.45	3.00	531.70	1991	BRK	15.0	4.0
MW339		15023897.93	1318660.60	541.27	538.41	9.7	19.7	UNKNOWN	NM	NM	8.44	532.83	9.00	529.41	1991	BRK	10.0	4.0
MW340		15023157.68	1318683.22	542.47	539.83	7.0	17.0	UNKNOWN	NM	NM	8.70	533.77	10.00	529.83	1991	COMBO	10.0	4.0
MW802		15025690.00	1320235.70	543.42	541.62	5.0	15.0	15.0	NM	NM	6.69	536.73	9.50	532.12	2008	COMBO	10.0	4.0
MW803		15025697.70	1320237.50	543.66	541.56	26.5	36.5	36.5	NM	NM	3.39	540.27	9.50	532.06	2008	BRK	10.0	4.0
MW804		15025916.10	1319219.30	536.48	533.78	5.0	15.0	15.0	NM	NM	5.07	531.41	3.50	530.28	2008	COMBO	10.0	4.0
MW805		15025913.60	1319229.60	536.27	533.62	25.0	35.0	35.0	NM	NM	5.18	531.09	3.50	530.12	2008	BRK	10.0	4.0
AEHA14R	M13	15034927.28	1322519.89	569.73	567.03	16.5	26.5	27.0	17.76	551.97	17.83	551.90	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
AEHA15		15034695.41	1322493.87	570.38	567.32	UNKNOWN	UNKNOWN	36.5	20.17	550.21	21.07	549.31		567.32	UNKNOWN	OVB	UNKNOWN	2.0
MW126R		15034092.63	1323332.31	562.41	563.00	11.0	21.0	22.0	16.03	546.38	15.95	546.46	UNKNOWN	UNKNOWN	2004	OVB	10.0	4.0
MW350		15032810.11	1321811.02	554.34	552.34	12.5	22.5	24.8	NM	NM	15.58	538.76	19.00	533.34	1991	COMBO	10.0	4.0
MW362		15034100.64	1323339.44	562.46	562.78	28.0	33.0	34.0	13.11	549.35	13.25	549.21	29.50	533.28	2004	BRK	5.0	4.0
MW363		15032768.31	1322536.05	570.03	567.66	21.0	31.0	32.0	27.85	542.18	27.90	542.13	31.50	536.16	2004	OVB	10.0	4.0
MW364		15032775.38	1322527.16	569.82	567.69	37.0	42.0	42.5	27.72	542.10	27.68	542.14	31.50	536.19	2004	BRK	5.0	4.0
MW806		15034807.20	1323337.90	565.53	UNKNOWN	15.0	25.0	25.0	13.98	551.55	14.09	551.44	29.00	UNKNOWN	2008	OVB	10.0	4.0
MW807		15034817.40	1323338.10	565.79	UNKNOWN	35.0	45.0	45.0	15.41	550.38	15.63	550.16	29.00	UNKNOWN	2008	BRK	10.0	4.0
MW808		15034539.90	1322493.10	569.23	UNKNOWN	15.0	25.0	25.0	17.38	551.85	17.09	552.14	30.00	UNKNOWN	2008	OVB	10.0	4.0
MW809		15034530.20	1322492.90	569.18	UNKNOWN	35.0	45.0	45.0	20.11	549.07	20.32	548.86	30.00	UNKNOWN	2008	BRK	10.0	4.0

Notes:

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

NM = Not Applicable, water levels not measured.

BRK = Bedrock

OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

TABLE 2-3

Monitoring Well Information - LAP Area
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW131	L1	15029483.20	1344039.100	625.01	622.29	2.5	22.5	24.0	18.02	606.99	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW171		15028774.67	1343406.032	618.24	615.03	2.9	7.9	11.1	10.75	607.49	8.00	607.03	1982	OVB	5.0	4.0
MW172		15028836.84	1344094.147	615.87	613.19	14.5	34.5	37.5	12.52	603.35	11.00	602.19	1982	BRK	20.0	4.0
MW173		15028827.26	1344123.204	615.56	612.56	2.8	11.8	15.2	12.25	603.31	12.00	600.56	1982	OVB	9.0	3.6
MW174		15028974.94	1344649.467	615.32	612.40	3.5	14.5	18.1	12.03	603.29	15.00	597.40	1982	OVB	11.0	3.6
MW175		15029420.69	1343046.596	634.45	630.96	3.7	19.7	23.2	15.14	619.31	20.00	610.96	1982	OVB	16.0	3.6
MW176		15030320.57	1343491.565	646.77	643.49	4.8	20.8	23.6	24.42	622.35	20.80	622.69	1982	OVB	16.0	3.6
MW177		15028773.31	1343380.183	616.29	613.84	11.8	31.0	33.4	7.99	608.30	6.50	607.34	1983	BRK	19.2	3.0
MW178		15030330.01	1343512.024	643.83	640.39	27.3	46.5	50.1	28.01	615.82	20.00	620.39	1983	BRK	19.2	3.0
MW400		15030872.22	1344840.211	655.17	652.56	16.2	26.2	28.6	NM	NM	21.00	631.56	1991	COMBO	10.0	4.0
MW401		15028228.22	1344007.476	611.96	610.20	28.5	43.5	46.1	10.46	601.50	16.00	594.20	1991	BRK	15.0	4.0
WES1		15029404.21	1343978.508	623.13	621.43	20.0	40.0	40.0	16.76	606.37	20.00	601.43	1997	BRK	20.0	4.0
WES2		15029874.92	1343699.213	637.69	635.98	22.0	42.0	42.0	26.11	611.58	22.00	613.98	1997	BRK	20.0	4.0
WES3		15028686.71	1344093.581	611.69	610.33	20.0	40.0	40.0	4.63	607.06	20.00	590.33	1997	BRK	20.0	4.0
MW610		15028213.06	1344005.102	612.63	609.62	4.0	14.0	14.0	11.22	601.41	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW611		15027976.15	1344327.569	620.45	617.83	10.0	20.0	21.0	14.01	606.44	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW132	L2	15026868.16	1339653.570	612.30	609.84	7.5	27.5	29.4	NM	NM	18.00	591.84	1981	COMBO	20.0	4.0
MW133		15026726.48	1338362.506	605.88	603.51	7.2	27.2	28.7	NM	NM	19.50	584.01	1981	COMBO	20.0	4.0
MW134		15025646.63	1338233.841	613.30	609.70	6.7	26.7	27.1	6.82	606.48	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW135		15025761.10	1339631.781	637.35	634.18	6.0	26.0	27.0	NM	NM	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW404		15026798.76	1338548.502	605.88	604.09	7.7	17.7	20.5	NM	NM	12.00	592.09	1991	COMBO	10.0	4.0
MW405		15027072.91	1338771.791	607.21	605.16	10.8	20.8	23.5	NM	NM	16.00	589.16	1991	COMBO	10.0	4.0
MW406		15026560.78	1339282.341	623.13	620.72	23.8	33.8	35.7	NM	NM	29.00	591.72	1991	COMBO	10.0	4.0
MW407		15026676.15	1339269.053	620.05	618.30	20.5	30.5	33.9	NM	NM	25.50	592.80	1991	COMBO	10.0	4.0
MW501		15025985.85	1338411.03	617.05	614.72	12.7	22.7	NA	NM	NM	25.00	589.72	1991	OVB	10.0	4.0
MW620		15027048.61	1338602.438	605.07	602.41	7.0	17.0	18.0	NM	NM	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW621		15027058.70	1338599.038	604.96	602.41	22.0	32.0	32.8	NM	NM	20.00	582.41	1999	BRK	10.0	4.0
MW810		15027142.71	1338476.770	604.58	601.91	7.0	17.3	18.0	NM	NM	UNKNOWN	UNKNOWN	2009	OVB	10.0	4.0
MW1	L3	15025237.01	1338193.456	630.63	628.68	16.5	26.5	27.8	16.77	613.86	UNKNOWN	UNKNOWN	1986	OVB	10.0	2.0
MW136		15024523.06	1337305.702	602.70	600.8	7.2	27.2	NA	8.22	594.48	11.00	589.80	1981	COMBO	20.0	4.0
MW137		15024661.00	1338608.636	632.90	631.40	7.0	27.0	28.7	4.55	628.35	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW3		15025504.29	1337801.715	610.34	608.50	9.0	19.0	20.9	4.87	605.47	19.00	589.50	1986	OVB	10.0	2.0
MW410		15025282.41	1337409.613	604.38	NA	8.0	18.0	20.3	12.06	592.32	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW411		15024977.88	1337383.946	616.71	NA	13.0	23.0	25.1	19.10	597.61	18.00	594.54	1991	COMBO	10.0	4.0
MW412		15024596.02	1337101.399	599.14	597.41	7.4	17.4	19.2	6.48	592.66	3.00	594.41	1991	BRK	10.0	4.0

TABLE 2-3

Monitoring Well Information - LAP Area
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Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW630	L3	15024770.15	1337013.674	595.06	592.23	7.0	12.0	12.7	6.73	588.33	4.00	588.20	1999	BRK	5.0	4.0
MW631		15024764.63	1337010.736	595.09	592.23	16.0	26.0	27.0	4.76	590.33	4.00	588.20	1999	BRK	10.0	4.0
MW632		15024828.58	1336912.350	606.25	603.75	12.0	27.2	27.5	15.89	590.36	UNKNOWN	UNKNOWN	2009	BRK	15.0	4.0
MW633		15024474.50	1336978.448	600.37	597.90	7.0	17.0	18.0	8.89	591.48	5.00	592.90	1999	BRK	10.0	4.0
H-7	L14	15019448.58	1332662.795	584.62	581.45	4.0	14.0	15.5	NM	NM	12.00	569.45	1982	OVB	10.0	2.0
H-8		15019409.64	1333457.292	591.40	588.14	7.0	22.0	22.9	NM	NM	20.00	568.14	1982	OVB	15.0	2.0
MW140		15018819.68	1332901.750	584.59	581.68	7.0	27.0	30.3	NM	NM	22.00	559.68	1981	COMBO	20.0	4.0
MW508		15019632.37	1333106.169	587.44	585.34	10.0	20.0	22.9	NM	NM	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW511		15019645.92	1333029.631	587.79	584.98	4.0	14.0	17.0	NM	NM	16.00	568.98	1997	OVB	10.0	4.0
MW512		15019541.13	1333111.131	588.04	585.98	5.0	15.0	18.2	NM	NM	16.00	569.98	1997	OVB	10.0	4.0
MW600		15019920.13	1332928.643	587.22	584.75	6.0	11.0	11.0	NM	NM	11.00	573.75	1998	OVB	5.0	2.0
MW601		15019196.31	1333121.302	586.72	584.29	9.0	19.0	20.0	NM	NM	19.60	564.69	1998	OVB	10.0	2.0
MW602		15019432.73	1332663.469	583.83	581.22	21.0	31.0	31.0	NM	NM	12.00	569.20	1999	BRK	10.0	4.0
MW603		15019323.75	1332379.579	580.77	578.27	6.0	16.0	16.0	NM	NM	13.00	565.30	1999	OVB	10.0	4.0
MW604		15019335.87	1332379.437	581.12	578.27	20.0	30.0	31.0	NM	NM	13.00	565.30	1999	BRK	10.0	4.0

General Notes

Water levels measured between April 10 and 13, 2012.

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

NM = Not Applicable, water levels not measured.

BRK = Bedrock

OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

TABLE 2-4

Surface Water Elevations
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Surface Water Location	Surface Water Elevation	
		Date	ft (MSL)
L1	SW550	4/10/2012	603.85
L3	SW557	4/10/2012	587.96
	SW558	4/10/2012	595.56
	SW777	4/10/2012	588.07(1)
	SW004	4/10/2012	589.43
M1	SW709	4/13/2012	532.71

General Note:

MSL = Mean Sea Level

Footnote:

(1) Surface water elevation not used in production of water table map due to elevation measured being higher than upstream location.

Table 3-1

Summary of Analytical Results - Explosives
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Compound		1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
	Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	Project Action Limit[1]		10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
	Surface Water RG		4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L1	***In-Plume***																													
	MW131	4/12/2012	5.4	/ J	<3.1		<3.1		65		70		<3.1		<1.6		<3.1		<3.1		<3.1		<1.6		<3.9		<1.6		**2200**	
	WES1	4/12/2012	<1.6		<3.1		<3.1		13		21	/ J	<3.1		3.9		<3.1		<3.1		<3.1		<1.6		<3.9		**40**	/ J	**38**	
	MW173	4/11/2012	<0.16		<0.31		<0.31		4.8		5.4		1.4	/ J	<0.16		<0.31		<0.31		<0.31		**10**		<0.39		<0.16		**12**	
	Early Warning																													
	MW174	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	WES3	4/11/2012	<0.16		<0.31		<0.31		0.67		1		<0.31		<0.16		<0.31		<0.31		<0.31		0.74		<0.39		0.2		1.2	
	Compliance																													
	SW550	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
L3	***Upgradient***																													
	SW004	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	In-Plume/Downgradient																													
	MW410	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW412	4/11/2012	<0.16		<0.31		<0.31		0.89		1.7		28	/ J	0.24		<0.31		<0.31		<0.31		**120**		<0.39		0.11	F / J	<0.16	
	Early Warning/Downgradient																													
	MW630	4/11/2012	<0.16		<0.31		<0.31		0.077	F / J	0.18	F / J	4.7	/ J	<0.16		<0.31		<0.31		<0.31		**8.7**		<0.39		<0.16		<0.16	
	MW630(DUP)	4/11/2012	<0.16		<0.31		<0.31		0.072	F / J	0.15	F / J	4.7	/ J	<0.16		<0.31		<0.31		<0.31		**8.7**		<0.39		<0.16		<0.16	
	MW631	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW633	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		2	/ J	<0.16		<0.31		<0.31		<0.31		**6.7**		<0.39		<0.16		<0.16	
	Compliance/Downgradient																													
	SW777	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		0.25		<0.39		<0.16		<0.16	
	Downgradient																													
	SW557	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		1.1	/ J	<0.16		<0.31		<0.31		<0.31		3.2		<0.39		<0.16		<0.16	
	SW558	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
MFG	***In-Plume***																													
(M6)	MW212R	4/15/2012	1.1	F /	**620**		**260**		64	/ J	51	/ J	<3.1		1.9		4100		<3.1		2100		<1.6		<3.9		<1.6		**39**	
	MW652	4/14/2012	9.5	F /	**8400**		**3300**		360		380	/ J	<31		<16		**44000**		<31		28000		<16		<39		<16		**1600**	
	MW652(DUP)	4/14/2012	7.9	F /	**6800**		**2700**		320		320	/ J	<31		<16		**35000**		<31		22000	/ J	<16		<39		<16		**1300**	
(M6)	***Early Warning***																													
	MW123R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW123R(DUP)	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW162R	4/14/2012	<0.16		0.27	F / J	0.14	F /	<0.31		<0.31		<0.31		<0.16		0.7		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	4/15/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW318	4/14/2012	<0.32		0.21	F / J	**0.45**	F / J	<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		<0.32	
	MW319	4/14/2012	<0.32		<0.62		<0.62		<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		0.29	F / J
	MW654	4/15/2012	<0.16		**1.7**		**0.97**		0.7		2.2		<0.31		<0.16		18		0.23	F / J	11		0.31	/ J	<0.39		<0.16		0.18	/ J
(M7)	MW124R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
(M6)	***Compliance***																													
(Other Areas)	MW117	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW118	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW119	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Table 3-1

Summary of Analytical Results - Explosives
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Compound		1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
	Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	Project Action Limit[(1)]		10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
	Surface Water RG		4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Upgradient***																													
	MW802	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	Downgradient																													
	MW335	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW336	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW805	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
M13	***Upgradient***																													
	MW806	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	Downgradient																													
	AEHA14R	3/1/2012	<0.16		<0.31		<0.31		0.79		1.1		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	AEHA15	3/1/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	MW126R	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		0.35		<0.31		0.3	F /	<0.16		<0.39		<0.16		<0.16	
	MW362	2/29/2012	<0.16		**1.5**		<0.31		0.83		0.78		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	4/16/2012	<0.16		**4.9**		<0.31		1.2		1.1		<0.31		<0.16		0.24	F / J	<0.31		<0.31	U / UJ	<0.16		<0.39		<0.16		0.073	F /
	MW362(DUP)	4/16/2012	<0.16		**5.4**		<0.31		1.2		1		<0.31		<0.16		2	/ J	0.19	F /	1.9	/ J	<0.16		<0.39		<0.16		0.097	F /
	MW808	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809(DUP)	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Footnotes:
(1) Project Action Limits (Remedial Goal{RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:
Only data collected in 2012 are shown.
< = Result shows laboratory Method Reporting Limit for non-detected results
µg/L = microgram per liter
1,3,5-TNB = 1,3,5-Trinitrobenzene
1,3-DNB = 1,3-Dinitrobenzene
2,4,6-TNT = 2,4,6-Trinitrotoluene
2,4-DNT = 2,4-Dinitrotoluene
2,6-DNT = 2,6-Dinitrotoluene
2-A-4,6-DNT = 2-amino-4,6-Dinitrotoluene
2-NT = 2-Nitrotoluene
3-NT = 3 Nitrotoluene
4-A-2,6-DNT = 4-amino-2,6-Dinitrotoluene
4-NT = 4-Nitrotoluene
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
HMX = High melting explosive
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
NB = Nitrobenzene
NJ = presumptive evidence that compound concentration is estimated
NS = No standard
RDX = Royal demolition explosive
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-2

Summary of Analytical Results - Target Analyte List Metals
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Analyte		Aluminum		Antimony		Arsenic		Barium		Cadmium		Calcium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium		Manganese		Mercury		Nickel		Potassium		Silver		Sodium		Vanadium		Zinc	
	Units		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
	Project Action Limit[1]		100		0.024		0.2		NS		0.05		NS		1.0		NS		NS		5.0		0.1		NS		10		NS		NS		NS		0.511		NS		NS		10	
	Surface Water RG		NS		0.61		0.16		5		0.0023		NS		0.44		NS		0.026		1.0		0.064		NS		1.0		0.103		1.0		NS		0.005		NS		NS		1.0	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L3	***Upgradient***																																							
	SW004	4/10/2012	<0.20		<0.020		<0.010		0.039		0.0009	F /	73		<0.010		<0.0050		0.018	/ U	<0.20		<0.0050		38		0.09		<0.20		<0.010		1.4		<0.0050		15		<0.0050		<0.020	
	In-Plume/Downgradient																																							
	MW412	4/11/2012	<0.20		<0.020		<0.010		0.042		0.0011	F /	96		<0.010		<0.0050		0.026	/ U	<0.20		<0.0050		51		<0.010		<0.20		<0.010		1		<0.0050		7.7		<0.0050		<0.020	
	Early Warning/Downgradient																																							
	MW630	4/11/2012	<0.20		<0.020		<0.010		0.011		0.00078	F /	83		<0.010		<0.0050		0.027	/ U	<0.20		<0.0050		43		0.033		<0.20		<0.010		4.4		<0.0050		22		<0.0050		0.0087	F /
	MW630(DUP)	4/11/2012	<0.20		<0.020		<0.010		0.011		0.00087	F /	84		<0.010		<0.0050		0.02	/ U	<0.20		<0.0050		44		0.032		<0.20		<0.010		4.4		<0.0050		22		<0.0050		<0.020	
	MW631	4/11/2012	<0.20		<0.020		<0.010		0.017		0.00082	F /	67		<0.010		<0.0050		0.015	/ U	<0.20		<0.0050		36		0.022		<0.20		<0.010		4.9		<0.0050		28		<0.0050		<0.020	
	MW633	4/11/2012	<0.20		<0.020		<0.010		0.047		0.00079	F /	83		<0.010		<0.0050		0.023	/ U	<0.20		<0.0050		37		<0.010		<0.20		<0.010		1		<0.0050		5.7		<0.0050		<0.020	
	Compliance/Downgradient																																							
	SW777	4/11/2012	<0.20		<0.020		<0.010		0.039		0.00087	F /	73		<0.010		<0.0050		0.0041	F / U	<0.20		<0.0050		39		0.06		<0.20		<0.010		1.4		<0.0050		14		<0.0050		0.0087	F /
	Downgradient																																							
	SW557	4/10/2012	<0.20		<0.020		<0.010		0.039		0.00085	F /	75		<0.010		<0.0050		0.023	/ U	<0.20		<0.0050		39		0.072		<0.20		<0.010		1.4		<0.0050		15		<0.0050		<0.020	
	SW558	4/10/2012	<0.20		<0.020		<0.010		0.042		0.00079	F /	80		<0.010		<0.0050		0.0066	F / U	<0.20		<0.0050		43		0.0027	F /	<0.20		<0.010		1		<0.0050		6.2		<0.0050		<0.020	
M11	***Upgradient***																																							
	MW802	4/16/2012	<0.20		<0.020		<0.010		0.026		<0.0020		75		<0.010		<0.0050		0.0012	F /	<0.20		<0.0050		34		0.75		<0.20		0.0023	F /	2		<0.0050		19		0.0025	F /	0.0078	F /
	Downgradient																																							
	MW335	4/16/2012	<0.20		<0.020		<0.010		0.021		<0.0020		210		<0.010		<0.0050		0.0051	F /	<0.20		<0.0050		140		<0.010		<0.20		0.0024	F /	6.4		<0.0050		48		0.0047	F /	0.0047	F /
	MW336	4/16/2012	<0.20		<0.020		<0.010		0.02		<0.0020		120		<0.010		<0.0050		0.0011	F /	0.15	F /	<0.0050		80		0.033		<0.20		<0.010		4.1		<0.0050		56		0.004	F /	0.0069	F /
	MW805	4/16/2012	<0.20		<0.020		<0.010		0.028		<0.0020		110		<0.010		<0.0050		0.0016	F /	<0.20		<0.0050		75		<0.010		<0.20		0.0059	F /	9.5		<0.0050		97		0.0037	F /	0.0078	F /
M13	***Upgradient***																																							
	MW806	2/29/2012	<0.20		<0.020		<0.010		0.096		<0.0020		76		0.001	F /	<0.0050		<0.010		<0.20		<0.0050		46		0.0017	F /	<0.20		<0.010		2.1	/ J	<0.0050		24		0.0031	F /	<0.020	
	MW806	4/16/2012	<0.20		<0.020		<0.010		0.082		0.00068	F /	68		<0.010		<0.0050		<0.010		<0.20		<0.0050		40	/ J	0.0024	F /	<0.20	U / UJ	<0.010		1.6		<0.0050		22	/ J	<0.0050		0.013	F /
	MW807	2/29/2012	0.026	F /	0.003	F / U	<0.010		0.097		<0.0020		180		<0.010		<0.0050		<0.010		0.82		0.0017	F / U	89		0.092		<0.20		0.0021	F /	14	/ J	<0.0050		400		0.004	F /	<0.020	
	MW807	4/16/2012	<0.20		<0.020		<0.010		0.088		0.00098	F /	160		<0.010		<0.0050		<0.010		0.59		<0.0050		79	/ J	0.11		<0.20	U / UJ	0.0025	F /	7.2		<0.0050		380	/ J	<0.0050		0.0095	F /
	Downgradient																																							
	AEHA14R	3/1/2012	0.027	F /	<0.020		<0.010		0.089		<0.0020		110		<0.010		<0.0050		0.0012	F /	<0.20		<0.0050		50		0.0019	F /	<0.20		<0.010		12		<0.0050		50		0.0029	F /	<0.020	
	AEHA15	3/1/2012	5.7		<0.020		0.0076	F /	0.1		<0.0020		140		0.0088	F /	0.0066		0.013		**15**		0.012		77		0.54		<0.20		0.013		4.6		<0.0050		20		0.014		0.029	
	MW126R	2/29/2012	<0.20		<0.020		<0.010		0.055		<0.0020		67		<0.010		<0.0050		<0.010		<0.20		0.0016	F / U	43		0.0088	F /	<0.20		<0.010		2.4	/ J	<0.0050		26		0.0029	F /	<0.020	
	MW126R	4/16/2012	<0.20		<0.020		<0.010		0.048		0.00078	F /	61		<0.010		<0.0050		<0.010		<0.20		<0.0050		39	/ J	0.0032	F /	<0.20	U / UJ	0.0022	F /	2		<0.0050		25	/ J	<0.0050		0.009	F /
	MW362	2/29/2012	<0.20		0.0035	F / U	<0.010		0.044		<0.0020		160		0.001	F /	0.0011	F /	<0.010		<0.20		0.0016	F / U	100		0.043		<0.20		0.0044	F /	8.5	/ J	<0.0050		180		0.0047	F /	<0.020	
	MW362	4/16/2012	0.034	F /	<0.020		<0.010		0.041		0.00098	F /	150		<0.010		<0.0050		<0.010		0.14	F /	<0.0050		89	/ J	0.078		<0.20	U / UJ	0.0042	F /	5.8		<0.0050		200	/ J	<0.0050		<0.020	
	MW362(DUP)	4/16/2012	<0.20		<0.020		<0.010		0.042		0.001	F /	150		<0.010		<0.0050		<0.010		0.38		<0.0050		93	/ J	0.078		<0.20	U / UJ	0.0063	F /	6		<0.0050		210	/ J	<0.0050		0.011	F /
	MW808	2/29/2012	<0.20		0.0033	F / U	<0.010		0.16		<0.0020		120		<0.010		0.0082		<0.010		1.7		<0.0050		67		0.55		<0.20		0.022		11	/ J	<0.0050		61		0.004	F /	0.0066	F /
	MW808	4/16/2012	<0.20		<0.020		<0.010		0.14		0.00081	F /	100		<0.010		0.016		0.0011	F /	2.6		<0.0050		59	/ J	0.89		<0.20	U / UJ	0.026		8.3		<0.0050		56	/ J	<0.0050		0.0069	F /
	MW809	2/29/2012	<0.20		0.0028	F / U	<0.010		0.031		<0.0020		41		<0.010		<0.0050		<0.010		<0.20		<0.0050		31		0.0055	F /	<0.20		<0.010		2.6	/ J	<0.0050		19		0.0022	F /	<0.020	
	MW809(DUP)	2/29/2012	<0.20		0.0031	F / U	<0.010		0.031		<0.0020		40		<0.010		<0.0050		<0.010		<0.20		0.0016	F / U	31		0.0059	F /	<0.20		<0.010		2.6	/ J	<0.0050		19		0.0024	F /	<0.020	
	MW809	4/16/2012	0.028	F /	<0.020		<0.010		0.028		0.00065	F /	38		<0.010		<0.0050		<0.010		0.094	F /	<0.0050		29	/ J	0.0024	F /	<0.20	U / UJ	0.0044	F /	2.4		<0.0050		19	/ J	<0.0050		0.0073	F /

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of analytes is used for reporting based on historically detected and reported compounds.
< = Result shows laboratory Method Reporting Limit for non-detected results
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
mg/L = milligrams per liter
NS = No standard
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-3

Summary of Analytical Results - Indicator Parameters
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Compound		Nitrate		Sulfate	
	Units		mg/L		mg/L	
	Project Action Limit[(1)]		10		400	
	Surface Water RG		NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***In-Plume***					
	MW107	4/12/2012	NA		**26,000**	
	MW231	4/12/2012	NA		**35,000**	
	MW640	4/12/2012	NA		**5,200**	
	MW641	4/12/2012	NA		**640**	
	MW641(DUP)	4/12/2012	NA		**640**	
	MW642	4/12/2012	NA		**420**	
	MW642(DUP)	4/12/2012	NA		**420**	
	Early Warning					
	MW643	4/13/2012	NA		58	
	MW644	4/13/2012	NA		160	
	Compliance					
	MW645	4/13/2012	NA		67	
	MW646	4/13/2012	NA		110	
	MW648	4/12/2012	NA		34	
	MW649	4/13/2012	NA		64	
	SW709	4/13/2012	NA		60	
MFG	***In-Plume***					
(M9)	MW330	4/17/2012	NA		**430**	
M11	***Upgradient***					
	MW802	4/16/2012	0.11		85	
	Downgradient					
	MW335	4/16/2012	0.31		**660**	
	MW336	4/16/2012	0.12		**410**	
	MW805	4/16/2012	0.22		**470**	
M13	***Upgradient***					
	MW806	2/29/2012	0.39		79	
	MW806	4/16/2012	0.39	/ J	80	
	MW807	2/29/2012	<1.0		230	
	MW807	4/16/2012	<1.0	U / UJ	230	
	Downgradient					
	AEHA14R	3/1/2012	1.7		140	
	AEHA15	3/1/2012	0.13		12	
	MW126R	2/29/2012	0.12		53	
	MW126R	4/16/2012	0.13		52	
	MW362	2/29/2012	<1.0		280	
	MW362	4/16/2012	<1.0		270	
	MW362(DUP)	4/16/2012	<1.0	U / UJ	270	
	MW808	2/29/2012	<0.10		99	
	MW808	4/16/2012	<0.10		88	
	MW809	2/29/2012	<0.10		5.9	
	MW809(DUP)	2/29/2012	<0.10		5.9	
	MW809	4/16/2012	0.13	/ J	5.4	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

mg/L = milligrams per liter
< = Result shows laboratory Method Reporting Limit for non-detected results
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
NA = not analyzed
NS = No standard
R = Rejected data, unusable
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-4

Summary of Analytical Results - Volatile Organic Compounds
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Compound		Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
	Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	Project Action Limit(1)		NS		25		NS		500		NS		3500		25		200		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
Site	Well	Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
M11	***Upgradient***																																			
	MW802	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	Downgradient																																			
	MW335	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW336	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW805	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
M13	***Upgradient***																																			
	MW806	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	2/29/2012	<5.0		<1.0		2.4	F /	<1.0		<1.0	U / UJ	1.4		<1.0		0.79	F /	<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	Downgradient																																			
	AEHA14R	3/1/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0	
	AEHA15	3/1/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0	
	MW126R	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW126R	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		0.23	F /	<1.0		<1.0	
	MW362	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362(DUP)	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	Downgradient																																			
	MW808	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809(DUP)	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds is used for reporting based on historically detected and reported compounds.
µg/L = micrograms per liter
< = Result shows laboratory method reporting limit for non-detected results
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
Bolded result indicates Project Action Limit (RG) exceedance
cis-1,2-DCE = cis-1,2-Dichloroethene
DUP = duplicate
F = Concentration below the reported detection limit
LF/VF = Lab Flag/Validation Flag
MEK = Methyl Ethyl Ketone (2-butanone)
MethCl = Methylene Chloride
NS = No standard
PCE = Tetrachloroethene
TCE = Trichloroethene
U = Not detected
UJ = Not detected, estimated detection limit
VC = Vinyl chloride

Table 3-5

Summary of Analytical Results - Semivolatile Organic Compounds
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	Compound		2,4-DNT		2,6-DNT		Naphthalene		NB		2-Methylnaphthalene		Phenol	
	Units		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	Project Action Limit[1]		0.42		0.42		NS		51		NS		NS	
Site	Well	Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
M11	***Upgradient***													
	MW802	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	Downgradient													
	MW335	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW336	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW805	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
M13	***Upgradient***													
	MW806	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW806	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	Downgradient													
	AEHA14R	3/1/2012	<1.3	U / UJ	<0.47	U / UJ	< 0.93	U / UJ	< 0.93	U / UJ	<0.47	U / UJ	<4.7	U / UJ
	AEHA15	3/1/2012	<1.5		<0.53		<1.1		<1.1		<0.53	U / UJ	<5.3	
	MW126R	2/29/2012	<1.3		<0.48		<0.95		<0.95		<0.48	U / UJ	<4.8	
	MW126R	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	4/16/2012	**3.3**		0.25	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362(DUP)	4/16/2012	**2.6**		0.29	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	Downgradient													
	MW808	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW808	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809(DUP)	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds analyzed is used for reporting based on historically detected and reported compounds.
< = Result shows laboratory method reporting limit for non-detected results
µg/L = micrograms per liter
2,4-DNT = 2,4-dinitrotoluene
2,6-DNT = 2,6-dinitrotoluene
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
LF/VF = Lab Flag/Validation Flag
NB = nitrobenzene
NS = No standard
R = Rejected data, unusable
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-6

Groundwater Horizontal Gradients
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	February 2012					April 2012				
Site	Well Number Groundwater Elevation (ft MSL)	Well Number Groundwater Elevation (ft MSL)	Head Difference (ft)	Horizontal Separation (ft)	Horizontal Gradient	Well Number Groundwater Elevation (ft MSL)	Well Number Groundwater Elevation (ft MSL)	Head Difference (ft)	Horizontal Separation (ft)	Horizontal Gradient
LAP AREA										
L1	MW176	MW173			L1 (North)	MW176	MW173			L1 (North)
	NM	NM	NM	1620	NM	622.35	603.31	19.04	1620	0.0118
	MW611	MW610			L1 (South)	MW611	MW610			L1 (South)
	NM	NM	NM	400	NM	606.44	601.41	5.03	400	0.0126
L3/	MW1	MW410				MW1	MW410			
Landfill L3	NM	NM	NM	780	NM	613.86	592.32	21.54	780	0.0276
MFG AREA										
M1	MW107	MW643				MW107	MW643			
	NM	NM	NM	430	NM	546.34	533.30	13.04	430	0.0303
M6	MW650	MW165			M6 (North)	MW650	MW165			(North)
	NM	NM	NM	930	NM	555.61	538.21	17.40	930	0.0187
	MW309	MW160			M6 (South)	MW309	MW160			(South)
	NM	NM	NM	840	NM	554.33	535.46	18.87	840	0.0225
M7	MW307	MW216				MW307	MW216			
	NM	NM	NM	1200	NM	544.01	531.43	12.58	1200	0.0105
Landfill M13	AEHA14R	MW126R				AEHA14R	MW126R			
	551.97	546.38	5.59	1160	0.0048	551.90	546.46	5.44	1160	0.0047
Landfill M11	MW802	MW804				MW802	MW804			
	NM	NM	NM	1030	NM	536.73	531.41	5.32	1030	0.0052

General Notes:
ft = feet
MSL = mean sea level
NM = Not Applicable, water levels not measured.

Table 3-7

Groundwater Flow Velocities
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Average K (cm/sec)	February Horizontal Gradient	April Horizontal Gradient	Effective Porosity	February		April	
					Velocity (cm/sec)	Velocity (ft/day)	Velocity (cm/sec)	Velocity (ft/day)
L1[(1)]	9.2E-06	NM	0.0122	0.3	NM	NM	0.0000	0.0011
L3/Landfill L3[(2)]	1.6E-03	NM	0.0276	0.3	NM	NM	0.0001	0.4172
M1	6.6E-05	NM	0.0303	0.3	NM	NM	0.0000	0.0189
MFG (M6)[(3)]	8.6E-04	NM	0.0206	0.3	NM	NM	0.0001	0.1674
MFG (M7)	6.7E-04	NM	0.0105	0.3	NM	NM	0.0000	0.0665
MFG (Landfill M13)	8.0E-02	0.0048	0.0047	0.3	0.0013	3.6274	0.0013	3.5518
Average for MFG Sites M6, M7, and M13	2.7E-02	NM	0.0119	0.3	NM	NM	0.0004	1.2619
Landfill M11[(4)]	6.7E-04	NM	0.0052	0.3	NM	NM	0.00001	0.0329

General Notes:

Hydraulic conductivity values are averages for the overburden aquifer.

Horizontal gradients are calculated using water table elevation data.

K = Hydraulic Conductivity

NM = Water levels not measured.

MFG = Manufacturing Area Sites.

cm/sec = centimeters per second

ft = feet

Foornotes:

(1) Average of north and south gradients at L1 used for April measurements.

(2) No hydraulic conductivity data were available for Site L3. Values used are from nearby Site L2.

(3) Average of north and south gradients at M6 used for April measurements.

(4) No hydraulic conductivity data were available for Site M11 Landfill. Value used is from nearby Site M7.

Table 3-8

Vertical Gradients
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammuntion Plant
Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)
LOAD-ASSEMBLE-PACKAGE AREA										
L1	MW178	640.39	27.3	46.5	19.2	603.49	NM	NM	615.82	-0.3462
	MW176	643.49	4.8	20.8	16.0	630.69	NM		622.35	
	MW172	613.19	14.5	34.5	20.0	588.69	NM	NM	603.35	0.0027
	MW173	612.56	2.8	11.8	9.0	605.26	NM		603.31	
	MW177	613.84	11.8	31.0	19.2	592.44	NM	NM	608.30	0.0538
	MW171	615.03	2.9	7.9	5.0	609.63	NM		607.49	
	MW401	610.2	28.5	43.5	15.0	574.20	NM	NM	601.50	0.0033
	MW610	609.62	4.0	14.0	10.0	600.62	NM		601.41	
L3/	MW631	592.23	16.0	26.0	10.0	571.23	NM	NM	590.33	0.1170
Landfill L3	MW630	592.23	7.0	12.0	5.0	582.73	NM		588.33	
MANUFACTURING AREA										
M1	MW640	545.4	29.0	39.0	10.0	511.40	NM	NM	544.17	0.0218
	MW351	545.68	9.5	19.5	10.0	531.18	NM		543.47	
	MW642	545.08	29.0	39.0	10.0	511.08	NM	NM	541.72	-0.0179
	MW641	545.08	7.0	17.0	10.0	533.08	NM		542.28	
MFG (M6)	MW312	545.96	40.0	55.0	15.0	498.46	NM	NM	547.55	0.0002
	MW311	546.36	14.0	24.0	10.0	527.36	NM		547.54	
	MW319	545.49	40.0	55.0	15.0	497.99	NM	NM	537.55	-0.0030
	MW318	545.23	11.8	21.8	10.0	528.43	NM		537.67	
	MW313	549.20	25.0	40.0	15.0	516.70	NM	NM	539.04	0.0201
	MW654	548.49	13.0	23.0	10.0	530.49	NM		538.60	
	MW317	540.71	34.0	49.0	15.0	499.21	NM	NM	536.28	-0.0123
	MW316	540.49	13.0	18.0	5.0	524.99	NM		536.74	
	MW310R	563.00	44.5	59.5	15.0	511.00	NM	NM	543.11	-0.2589
	MW309	563.43	12.7	27.7	15.0	543.23	NM		554.33	
	MW315	538.91	29.7	44.7	15.0	501.71	NM	NM	535.41	-0.0003
	MW314	539.53	9.7	14.7	5.0	527.33	NM		535.42	

RJR/rjr/DLF
\\USDET1S02\jobs\Madison Projects\209\1115\2012 Semi-annual Report\Final\Tables\Table 3-8 Vert Grads
4/24/2013

Table 3-8

Vertical Gradients
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammuntion Plant
Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)
MFG (M6)	MW308	561.38	50.5	65.5	15.0	503.38	NM	NM	542.26	-0.0431
	MW307	561.45	17.0	27.0	10.0	539.45	NM		544.01	
MFG (M7)	MW158	531.58	9.0	29.5	20.5	512.33	NM	NM	530.34	0.0000
	MW157	531.37	3.7	10.2	6.5	524.42	NM		530.34	
	MW217	536.90	19.5	34.5	15.0	509.90	NM	NM	531.94	0.0237
	MW216	536.51	5.0	10.0	5.0	529.01	NM		531.43	
	MW322	542.26	34.5	49.5	15.0	500.26	NM	NM	533.79	-0.1052
	MW321	542.93	13.5	23.5	10.0	524.43	NM		537.73	
	MW661	537.09	20.0	30.0	10.0	512.09	NM	NM	532.82	-0.0486
	MW660	537.08	7.0	12.0	5.0	527.58	NM		533.88	
Landfill M11	MW802	541.62	5.0	15.0	10.0	531.62	NM	NM	536.73	0.1327
	MW803	541.56	26.5	36.5	10.0	510.06	NM		540.27	
	MW804	533.78	5.0	15.0	10.0	523.78	NM	NM	531.41	-0.0115
	MW805	533.62	25.0	35.0	10.0	503.62	NM		531.09	
Landfill M13	MW126R	563.00	11.0	21.0	10.0	547.00	546.38	0.2106	546.46	0.1939
	MW362	562.78	28.0	33.0	5.0	532.28	549.35		549.21	
	MW363	567.66	21.0	31.0	10.0	541.66	542.18	-0.0057	542.13	0.0007
	MW364	567.69	37.0	42.0	5.0	528.19	542.10		542.14	
	MW806	563.73	15.0	25.0	10.0	543.73	551.55	-0.0421	551.44	-0.0463
	MW807	563.79	35.0	45.0	10.0	523.79	550.38		550.16	
	MW808	567.33	15.0	25.0	10.0	547.33	551.85	-0.1131	552.14	-0.1319
	MW809	567.28	35.0	45.0	10.0	527.28	549.07		548.86	

Notes:

$$\text{Vertical Gradient} = \frac{\text{Water Level in Deep Well - Water Level in Shallow Well}}{\text{ABS (Water Table Elevation - Screen Midpoint of Deep Well)}}$$

Negative vertical gradients indicate downward flow, positive indicates upward flow.

ft = feet

ft/ft = feet per foot

MSL = mean sea level

NM = not measured

ID = identification

MFG = Manufacturing Area Sites

RJR/rjr/DLF
\\USDET1S02\jobs\Madison Projects\209\1115\2012 Semi-annual Report\Final\Tables\Table 3-8 Vert Grads
4/24/2013

TABLE 3-9

Proposed Sample Plan - Fall 2012
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Wilmington, Illinois

Site	Well ID	Parameter
L1	***In-plume***	
	MW131	E
	MW173	E
	WES1	E
	Early Warning	
	WES3	E
	MW174	E
	Compliance	
	SW550	E
L2	***In-plume***	
	MW404	E
	Early Warning	
	MW620	E
	Compliance	
	MW621	E
	SW555	E
L3/ Landfill L3	***In-plume/Downgradient***	
	MW410	E
	MW412	E, M
	Early Warning/Downgradient	
	MW630	E, M
	MW631	E, M
	MW633	E, M
	Compliance/Downgradient	
	SW777	E, M
	Downgradient	
	SW557	E, M
	SW558	E, M
L14	***In-plume***	
	MW511	E
	MW512	E
	Early Warning	
	H7	E
	MW603	E
	MW604	E
M1	***In-plume***	
	MW107	S
	MW231	S
	MW640	S
	MW641	S
	MW642	S
	Early Warning	
	MW643	S
	MW644	S
	Compliance	
	MW645	S
	MW646	S
	MW648	S
	MW649	S
	SW709	S

TABLE 3-9

Proposed Sample Plan - Fall 2012
2012 Semi-Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Wilmington, Illinois

Site	Well ID	Parameter
MFG	***In-plume***	
	MW212R	E
	MW330	S
	MW652	E
	Early Warning	
	MW123R	E
	MW124R	E
	MW162R	E
	MW313	E
	MW318	E
	MW319	E
	MW654	E
	Compliance	
	MW117	E
	MW118	E
	MW119	E
Landfill M11	***Upgradient***	
	MW802	E, I, M, SVOC & V
	Downgradient	
	MW335	E, I, M, SVOC & V
	MW336	E, I, M, SVOC & V
	MW805	E, I, M, SVOC & V
Landfill M13(1)	***Upgradient***	
	MW806	E, I, M, SVOC & V
	MW807	E, I, M, SVOC & V
	Downgradient	
	MW126R	E, I, M, SVOC & V
	MW362	E, I, M, SVOC & V
	MW808	E, I, M, SVOC & V
	MW809	E, I, M, SVOC & V

General Notes:
V - Volatile Organic Compounds (VOCs)
SVOC - Semivolatile organic compounds
E - Explosives
M - Metals
I - Indicator parameters (Nitrate-N and Sulfate)
S - Sulfate
MFG - Manufacturing Area

Footnotes:
(1) Site M13 Landfill monitoring wells are sampled quarterly for these parameters in compliance with Illinois Administrative Code.

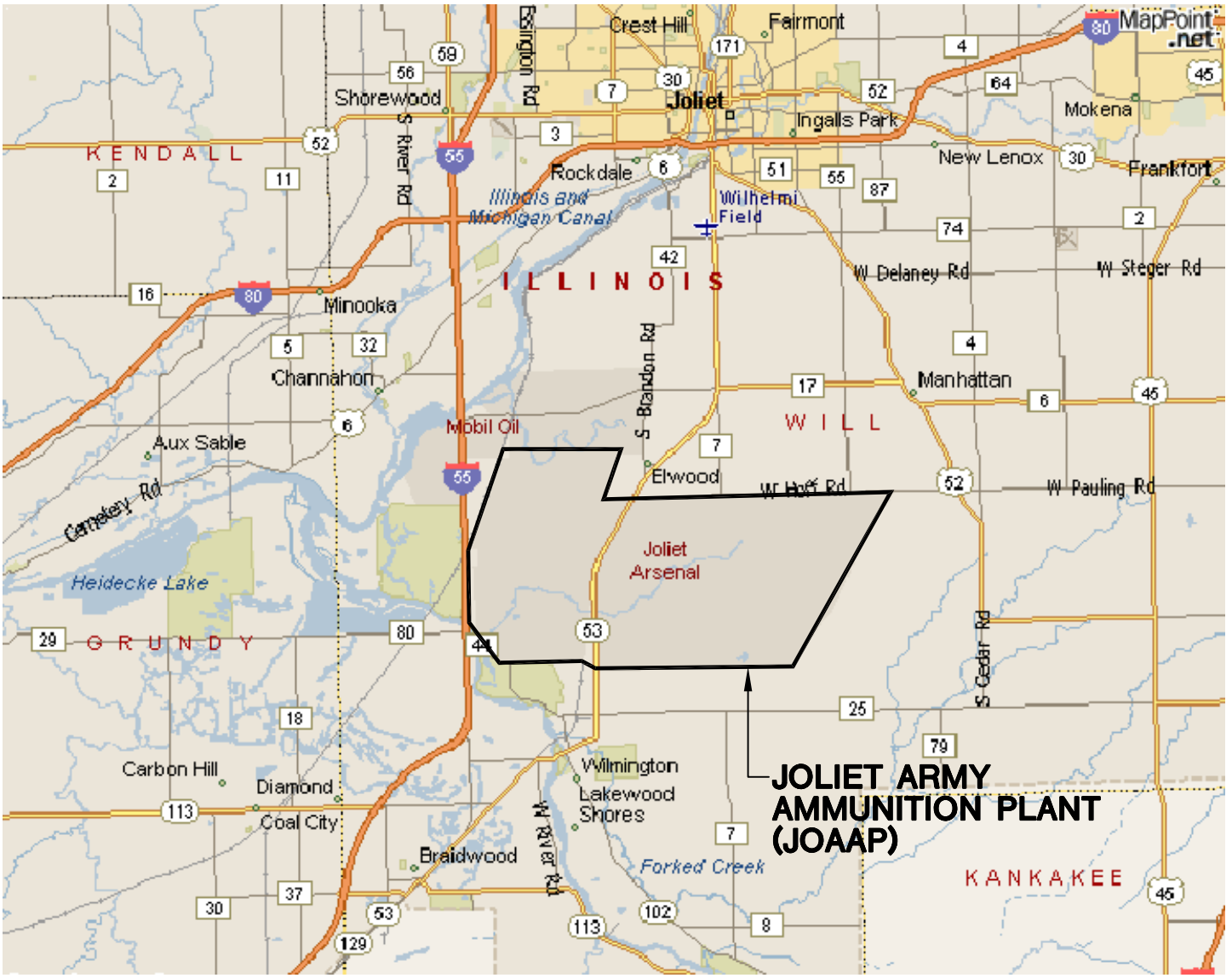
TABLE 4-1

Summary of Recommendations
2012 Semi-annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Report	Recommendation	Reasoning	Status Initiated/Pending
2009 Semi-annual			
	No recommendations regarding the monitoring program		
2009 Annual			
	Fall Sampling only at L2	Section 4.1.2.5 of LTM Plan, round with highest concentration	Initiated, Site L2 will not be sampled spring 2012
	Remove TAL metals analysis from Site L3 well MW410	No metals exceedances since sampling re-initiated in spring 2008	Initiated, metals at well MW410 were not sampled beginning fall 2011
	Remove Site M5 well MW207R from monitoring program	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW207R was not sampled beginning fall 2011
	Remove Site M3 wells MW233 and MW352 from monitoring program	Section 4.1.6.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, wells MW233 and MW352 were not sampled beginning fall 2011
	Prepare closure report for Site M3	Section 4.1.6.6 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
2010 Semi-annual			
	Remove Site L2 well MW501 from monitoring program	Section 4.1.2.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW501 was not sampled fall beginning 2011
	Fall Sampling only at L14	Section 4.1.4.5 of LTM Plan, round with highest concentration	Initiated, Site L14 will not be sampled spring 2012
	Prepare closure report for Site M5	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
	Remove cadmium analysis from Site M6 well MW123R	Section 4.1.7.4 of LTM Plan, no cadmium detections	Initiated, cadmium at well MW123R was not analyzed beginning fall 2010
2010 Annual			
	Remove Site L1 compliance well MW401 from monitoring program	No explosives detections. Site has upgradient early warning wells with no detections	Initiated, well MW401 will not be sampled beginning spring 2012
	Remove Site L1 early warning well MW172 from monitoring program	Well MW172 redundant with well MW173, upward vertical gradients	Initiated, well MW172 will not be sampled beginning spring 2012
	Change designation of Site L1 well MW173 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site L2 compliance well MW810 from monitoring program	No explosives detections. Site had upgradient early warning wells with no detections	Initiated, L2 is no longer sampled in spring and well MW810 will not be sampled in fall 2012
	Remove Site L3 compliance well MW632 from monitoring program	No explosives detections. Hydraulics suggest well not within migration flowpath	Initiated, well MW632 will not be sampled beginning spring 2012
	Change designation of Site M1 wells MW640, MW641, and MW642 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site M8 in-plume well MW148RR from monitoring program	In-plume well with no sulfate exceedances since spring 2009	Initiated, well MW148RR will not be sampled beginning spring 2012
	Remove Site M13 wells AEHA14R and AEHA15 from monitoring program and abandon	Problematic wells	Initiated, wells AEHA14R and AEHA15 will not be sampled beginning spring 2012
2011 Semi-annual			
	No new recommendations		
2011 Annual			
	At Site L3/Landfill L3 sample SW004 in spring only	Upstream sample SW555 provides data for fall rounds	Initiated, SW004 will no longer be sampled in fall when Site L2 is sampled
	Rip rap along Prairie Creek at Site L3 required repair	Rip rap has been washed away at some locations	Pending
	Remove Site Landfill L3/Landfill L3 upgradient well MW03 from monitoring program	No RG exceedances at Site L3 in-pume well MW410	Initiated, well MW03 will not be sampled beginning spring 2012
	Remove Site L14 in-plume well MW508 from monitoring program	No RG exceedances	Initiated, well MW508 will not be sampled beginning spring 2012
	Remove Site L14 compliance wells MW603 and MW604 from monitoring program	Redundant, no RG exceedances in early warning well H7	Initiated, wells MW603 and MW604 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW115 and MW116 from monitoring program	Redundant, no RG exceedances in upgradient Site M6 early warning wells MW123R and MW162R or Site M7 early warning well MW124R	Initiated, wells MW115 and MW116 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW112 and MW113 from monitoring program	Removal of upgradient Site M5 in-plume well MW207R from monitoring program and Site M5 closure	Initiated, wells MW112 and MW113 will not be sampled beginning spring 2012
	Prepare closure report for Site M8	Removal of in-plume well MW148RR from monitoring program	Closure Report will be prepared in 2013
	Fall Sampling only at M11	Section 4.2.2.5 of LTM Plan, stable and predictable results	Pending, recommendation has not been approved. However wells MW333, MW334, MW803, and MW804 will not be sampled in spring 2012
2012 Semi-annual			
	Rip rap along Prairie Creek at Site L3 required repair	Rip rap has been washed away at some locations	Pending
	Install monitoring well downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15	Monitoirng wells AEHA14R and AEHA15 removed from monitoring program.	Pending

Notes:
Does not include minor maitenance activities such as replacing well locks.
Does not include recommendations repeated in subsequent reports.

FIGURES



QUALITY CONTROL	GRAPHIC STANDARDS	TECHNICAL REVIEW	MANAGEMENT REVIEW
	LEAD PROFESSIONAL	PROJECT MANAGER	OTHER
DLF 5-16-12	DLF 5-16-12	RJR 6-19-12	RJR 6-19-12

NOTE

BASE MAP DEVELOPED FROM 2002 MICROSOFT CORPORATION, EXPEDIA.COM.

north

RJR DEVELOPED BY / DLF DRAWN BY; 12/18/28 APPROVED BY / DATE; REVISIONS / DATE	CONTRACT NO. W91ZLK-05-D-0012 DELIVERY ORDER NO. 0001	SITE LOCATION MAP	FIGURE 1-1
	VERIFY SCALE 0 1/2 1 BAR REPRESENTS ONE INCH; SCALE 1"=4 Miles (Approx.)	2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS	TOLTEST, INC.

File: L:\JOBS\209\1115\05\401\cadd\Figure 1-1.dwg Dec 18, 2012 - 2:39pm

QUALITY CONTROL	GRAPHIC STANDARDS LEAD PROFESSIONAL	DLF 5-7-12 RJR 6-19-12	TECHNICAL REVIEW PROJECT MANAGER	RJR 6-19-12	MANAGEMENT REVIEW OTHER

LEGEND

- APPROXIMATE JOAAP BOUNDARY
- HIGH TENSION TRANSMISSION LINE
- RAILROAD
- M8 STUDY AREA IDENTIFIER
- STUDY AREA BOUNDARY
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- SURFACE WATER

NOTE

BASE MAP DEVELOPED FROM A DRAWING TITLED "SOILS OU – PROPOSED PLAN LAYOUT", PREPARED BY OHM REMEDIATION SERVICES CORP., DATED OCTOBER 1997 AND FIGURE 2 – "GROUNDWATER OPERABLE UNIT SUMMARY OF PROPOSED PLAN", PREPARED BY OHM REMEDIATION SERVICES CORP., DATED DECEMBER 12, 1997.

Des Plaines River
North Pumping Station
Smith's Bridge Road
Manufacturing (MFG) Area
Asparagus Lane
Jackson Creek
McCune Cemetery
Drummond Road
Maple Hill Cemetery
N. Acid Rd.
S. Acid Rd.
M9
Connecting Road
VILLAGE OF ELWOOD
53
Load-Assemble-Package (LAP) Area
Atchison Topeka & Santa Fe Railroad
West TNT Road
M6
M8
Base Line Road
Hoff Road
Road 2 North
Red Water Lagoon
Snake Road
W. Acid Rd.
E. Acid Rd.
LANDFILL M13
Tetryl Road
M4
M7
M5
Reed Cemetery
Diagonal Road
Southern Pacific Railroad
Road 1 West
Chicago Road
Road 1 East
East
Road 2
Klinger Cemetery
Blodgett Road
M3
Road 1 North
L1
Prairie Creek
West Patrol Road
Explosive Road
55
A Line Road
School House Road
Kemery Lake
L2
Central Road
Road 2 West
LANDFILL M11
Newton Cemetery (Singel Grave)
L3/LANDFILL L3
Starr Grove Cemetery
MacArthur Drive
Road 1/2 South
Prairie Creek
M1
South Patrol Road
JOAAP Administration Office
L14
Victory Drive
Road 1 South
Wabash Railroad
Kankakee River
Road 1/2 West
Plant Dr.
Chicago Road Cemetery
Pond
Doyle Lake
New River Road
53
Road 2 South
Quigley Road

north

DLF — DRAWN BY
RJR — DEVELOPED BY
12/18/12 — DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 4000'

REV	DATE	BY	DESCRIPTION

GROUNDWATER STUDY AREAS AND LANDFILL SITES
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

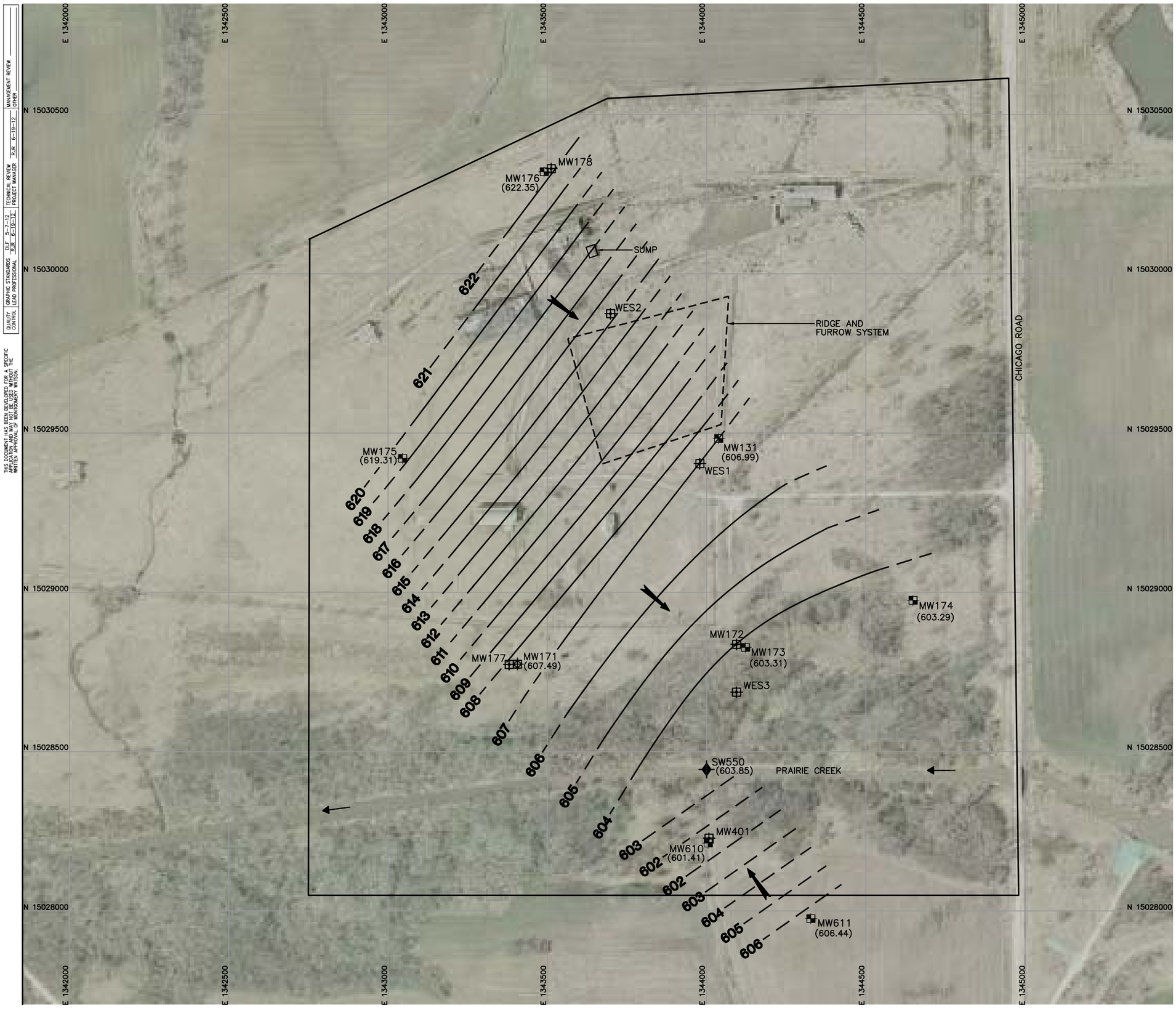
PRINTED
12/18/2012

FIGURE 1-2

DRAWING NUMBER
2091115
05010401

USAEC

IDOT



LEGEND

- MW175 (619.31) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW171 (607.49) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW178 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW550 (603.85) — SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER ELEVATION
- 610 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11 AND 12, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW171 IS A SHALLOW BEDROCK MONITORING WELL USED AS A HORIZONTAL CONTROL POINT.

north

QUALITY CONTROL	GRAPHIC STANDARDS	TECHNICAL REVIEW	MANAGEMENT REVIEW
	DLF 5-2-12		
	LEAD PROFESSIONAL JMR 6-19-12	PROJECT MANAGER JMR 6-19-12	OTHER

DLF — DRAWN BY
RJR — DEVELOPED BY
12/18/12 — DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP - LAP AREA, SITE L1 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

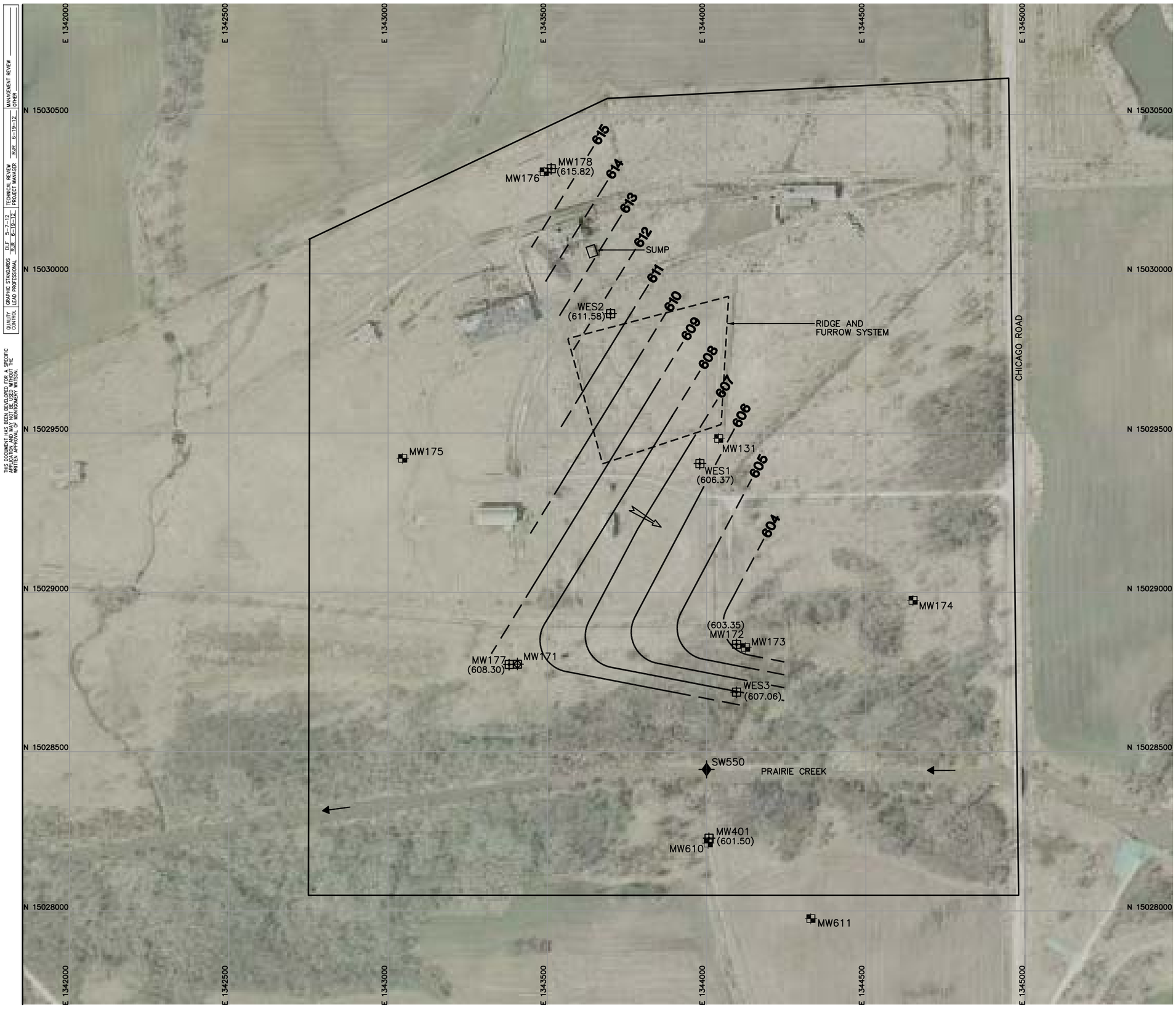
PRINTED
12/18/2012

FIGURE 3-1

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



LEGEND

- MW176 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW171 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW178 (615.82) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW550 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 608 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11 AND 12, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

north

QUALITY CONTROL	GRAPHIC STANDARDS LEAD PROFESSIONAL	DLF 5-2-12 JMR 6-19-12
	TECHNICAL REVIEW PROJECT MANAGER	JMR 6-19-12
	MANAGEMENT REVIEW OTHER	

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP - LAP AREA, SITE L1 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

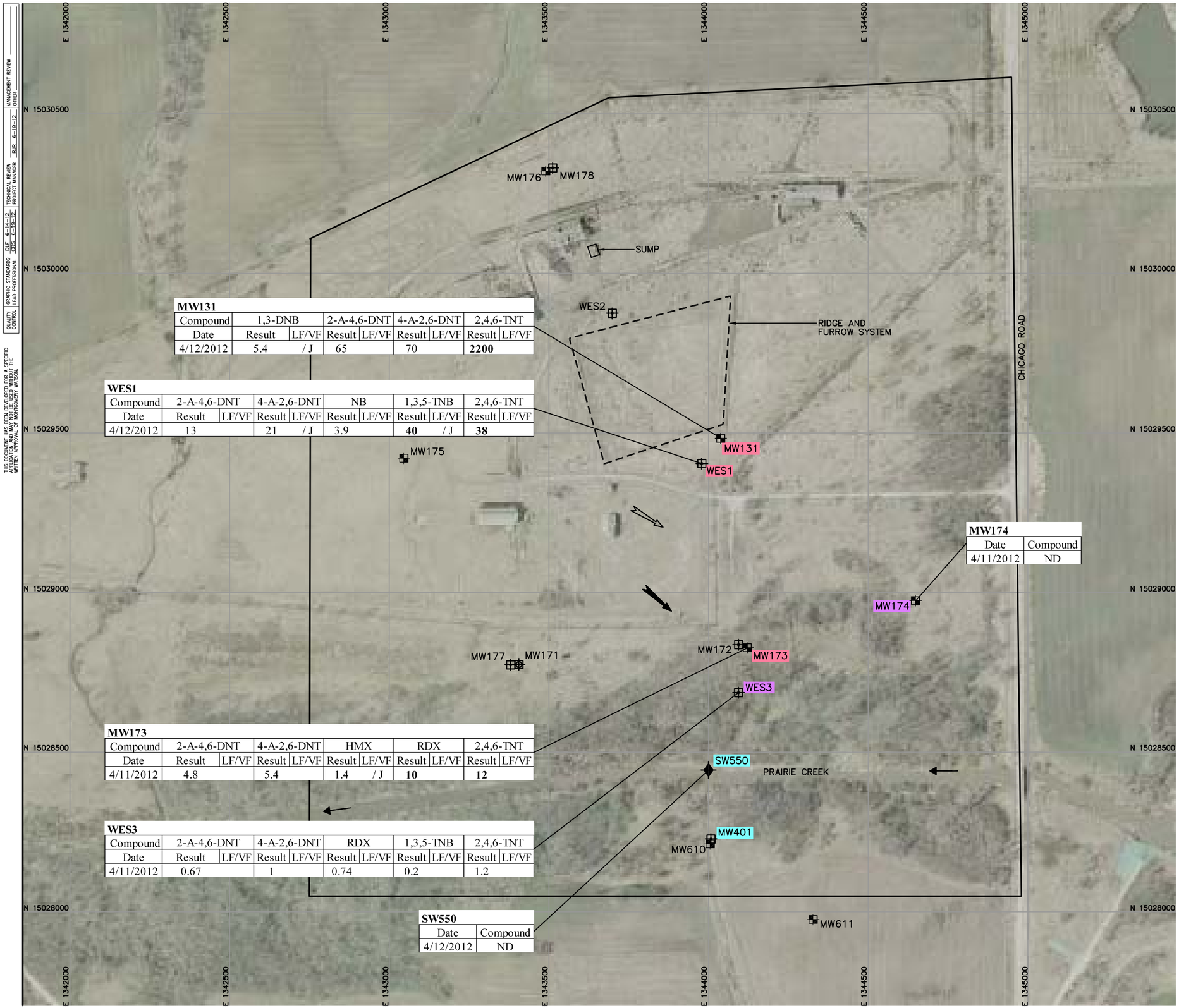
PRINTED
12/18/2012

FIGURE 3-2

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC



MW131

Compound	1,3-DNB		2-A-4,6-DNT		4-A-2,6-DNT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/12/2012	5.4	/ J	65		70		**2200**	

WES1

Compound	2-A-4,6-DNT		4-A-2,6-DNT		NB		1,3,5-TNB		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/12/2012	13		21	/ J	3.9		**40**	/ J	**38**	

MW174

Date	Compound
4/11/2012	ND

MW173

Compound	2-A-4,6-DNT		4-A-2,6-DNT		HMX		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	4.8		5.4		1.4	/ J	**10**		**12**	

WES3

Compound	2-A-4,6-DNT		4-A-2,6-DNT		RDX		1,3,5-TNB		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.67		1		0.74		0.2		1.2	

SW550

Date	Compound
4/12/2012	ND

LEGEND

- MW173 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW171 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW172 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- SW550 — SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

1,3-DNB	1,3-DINITROBENZENE
1,3,5-TNB	1,3,5-TRINITROBENZENE
2,4,6-TNT	2,4,6-TRINITROTOLUENE
2-A-4,6-DNT	2-AMINO-4,6-DINITROTOLUENE
4-A-2,6-DNT	4-AMINO-2,6-DINITROTOLUENE
NB	NITROBENZENE
HMX	HIGH MELTING EXPLOSIVE
RDX	ROYAL DEMOLITION EXPLOSIVE
/J	ESTIMATED CONCENTRATION
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit(1)	Surface Water RG
1,3-DNB	10	4
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
RDX	2.6	500
1,3,5-TNB	5.1	15
2,4,6-TNT	9.5	75
NB	51	8000

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

MANAGEMENT REVIEW / OTHER
TECHNICAL REVIEW / PROJECT MANAGER — RJR 6-19-12
GRAPHIC STANDARDS / LEAD PROFESSIONAL — DLF 6-14-12, JDS 6-13-12
QUALITY CONTROL

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS - LAP AREA, SITE L1 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/18/2012

FIGURE 3-3

DRAWING NUMBER
2091115
05010401

USAEC — U.S. ARMY ENVIRONMENTAL COMMAND

TOLTEST, INC.

LEGEND

- MW134 (606.48) — OVERBURDEN MONITORING WELL LOCATION, NUMBER AND WATER TABLE ELEVATION
- MW136 (594.48) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW630 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW412 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW557 (587.96) — SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER ELEVATION
- 600 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 10 AND 11, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
6. MW136 IS A COMBINATION OVERBURDEN/BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.
7. MW134 IS A SITE L2 MONITORING WELL USED AS A HORIZONTAL CONTROL POINT DUE TO ITS PROXIMITY TO SITE L3/LANDFILL L3.

north

QUALITY CONTROL | GRAPHIC STANDARDS — LEAD PROFESSIONAL | DLF 6-19-12 | BJR 6-19-12
TECHNICAL REVIEW — PROJECT MANAGER | RJR 6-19-12
MANAGEMENT REVIEW — OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP - LAP AREA, SITE L3/LANDFILL L3 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

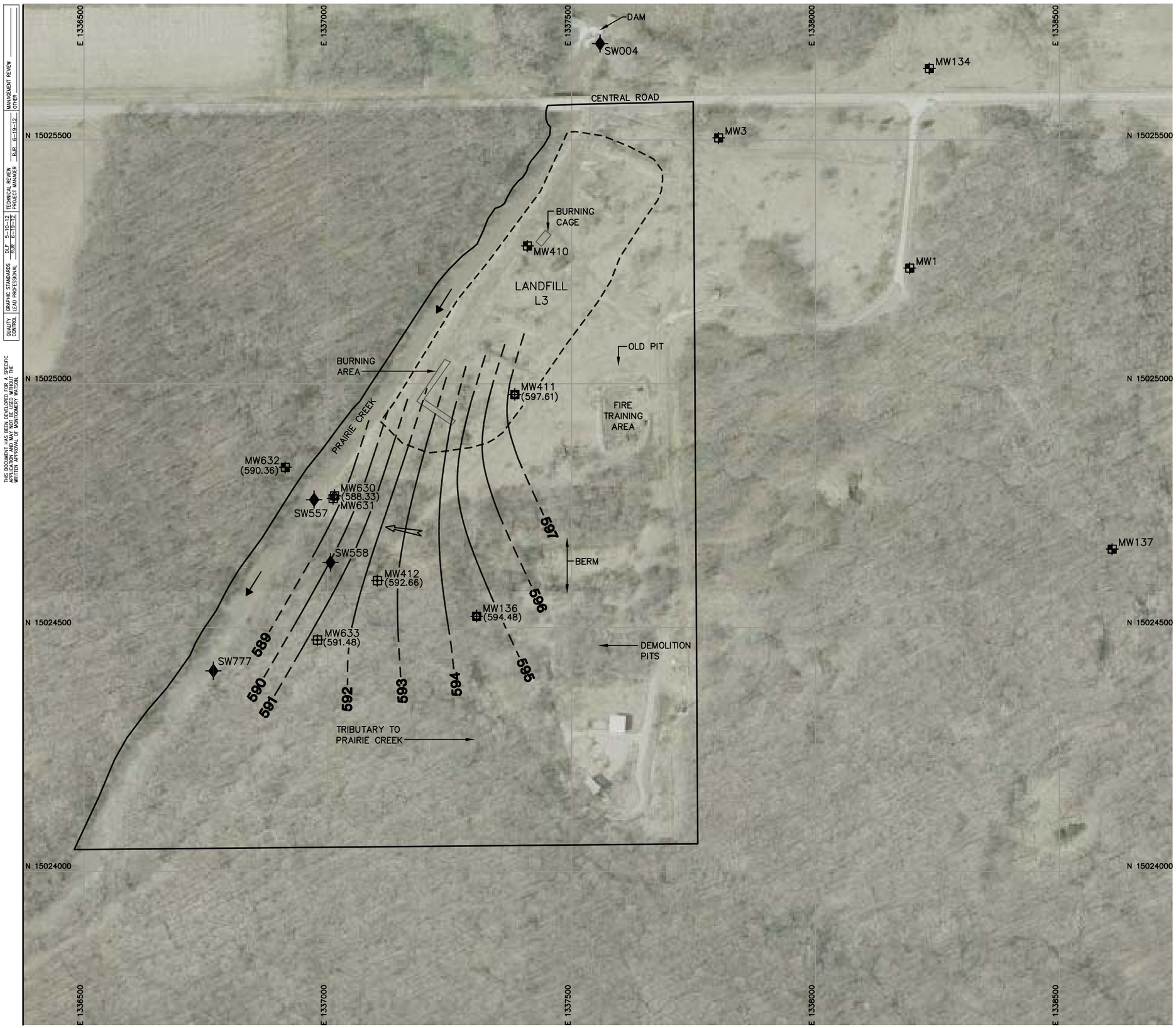
PRINTED
12/18/2012

FIGURE 3-4

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



LEGEND

- MW134 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW136 (594.48) — COMBINED MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW630 (588.33) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW412 (592.66) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW777 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 595 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
6. MW411 AND MW136 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED FOR HORIZONTAL CONTROL POINTS.

north

QUALITY CONTROL | GRAPHIC STANDARDS | LEAD PROFESSIONAL | DLF 6-19-12 | BJR 6-19-12 | TECHNICAL REVIEW | PROJECT MANAGER | BJR 6-19-12 | MANAGEMENT REVIEW | OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – LAP AREA, SITE L3/LANDFILL L3 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

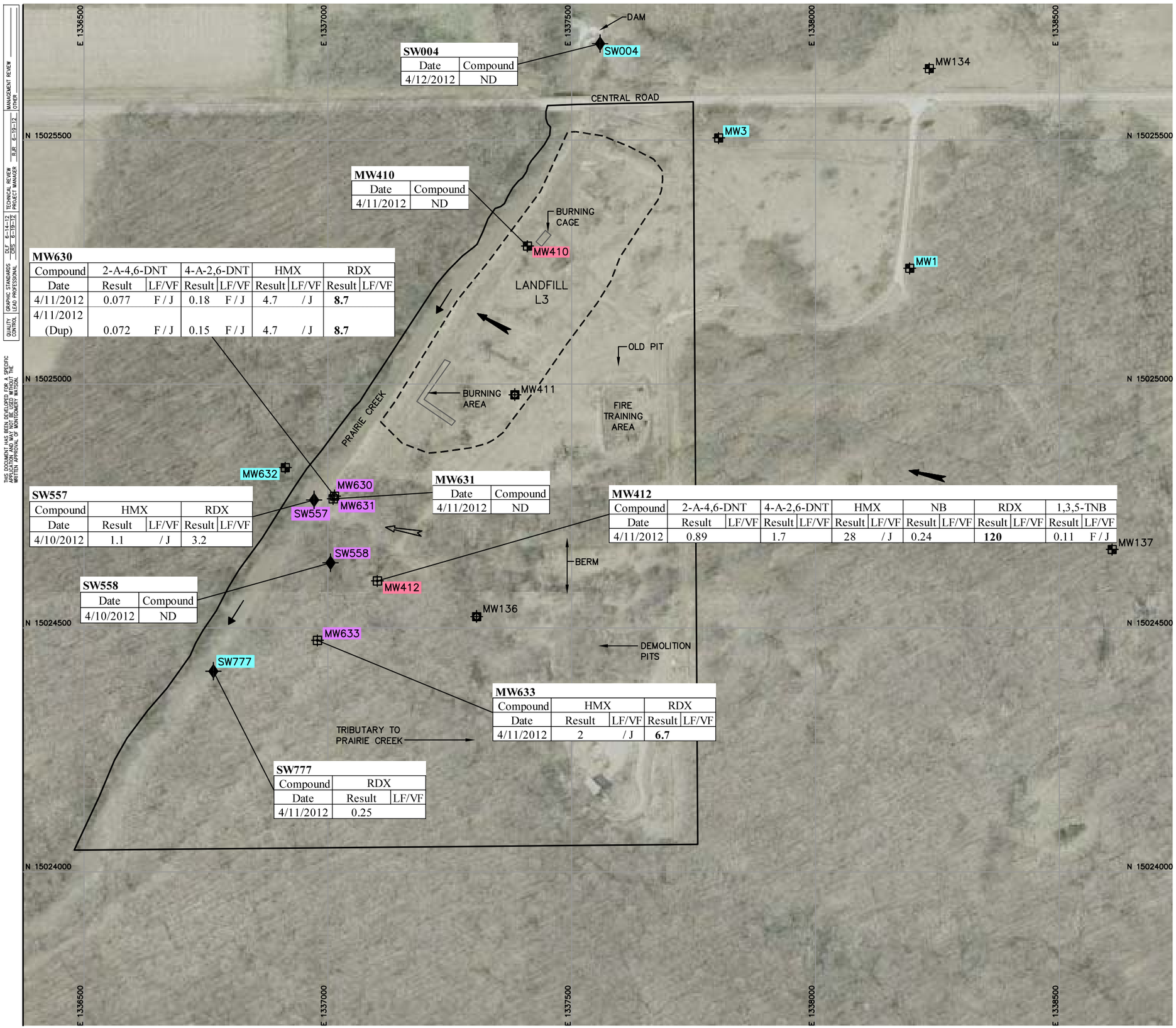
PRINTED 12/18/2012

FIGURE 3-5

DRAWING NUMBER 2091115 05010401

USAEC

TOLTEST, INC



SW004

Date	Compound
4/12/2012	ND

MW410

Date	Compound
4/11/2012	ND

MW630

Compound	2-A-4,6-DNT		4-A-2,6-DNT		HMX		RDX	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.077	F / J	0.18	F / J	4.7	/ J	**8.7**	
4/11/2012 (Dup)	0.072	F / J	0.15	F / J	4.7	/ J	**8.7**	

SW557

Compound	HMX		RDX	
Date	Result	LF/VF	Result	LF/VF
4/10/2012	1.1	/ J	3.2	

MW631

Date	Compound
4/11/2012	ND

MW412

Compound	2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		RDX		1,3,5-TNB	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.89		1.7		28	/ J	0.24		**120**		0.11	F / J

SW558

Date	Compound
4/10/2012	ND

MW633

Compound	HMX		RDX	
Date	Result	LF/VF	Result	LF/VF
4/11/2012	2	/ J	**6.7**	

SW777

Compound	RDX	
Date	Result	LF/VF
4/11/2012	0.25	

LEGEND

- MW410 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW411 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW630 — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW412 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- SW777 — SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLSOIVES DETECTIONS
- IN-PLUME/DOWNGRADIENT MONITORING POINT
- EARLY WARNING/DOWNGRADIENT MONITORING POINT
- COMPLIANCE/DOWNGRADIENT AND UPGRADIENT MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

1,3,5-TNB	1,3,5-TRINITROBENZENE
2-A-4,6-DNT	2-AMINO-4,6-DINITROTOLUENE
4-A-2,6-DNT	4-AMINO-2,6-DINITROTOLUENE
NB	NITROBENZENE
HMX	HIGH MELTING EXPLOSIVE
RDX	ROYAL DEMOLITION EXPLOSIVE
DUP	DUPLICATE
F/	CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
/J	ESTIMATED CONCENTRATION
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit[1]	Surface Water RG
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
RDX	2.6	500
1,3,5-TNB	5.1	15
NB	51	8000

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.

north

MANAGEMENT REVIEW — OTHER
TECHNICAL REVIEW — PROJECT MANAGER — RJR 6-19-12
GRAPHIC STANDARDS — DLF 6-14-12
QUALITY CONTROL — LEAD PROFESSIONAL — DRS 6-13-12

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – LAP AREA, SITE L3/LANDFILL L3 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/18/2012

FIGURE 3-6

DRAWING NUMBER 2091115 05010401

USAEC — U.S. ARMY ENVIRONMENTAL COMMAND

TOLTEST, INC.

LEGEND

- MW104 (543.05) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW105 (548.99) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW201 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW709 (532.71) — SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER TABLE ELEVATION
- 540 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 12 AND 13, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW105 AND MW107 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

QUALITY CONTROL | GRAPHIC STANDARDS | TECHNICAL REVIEW | MANAGEMENT REVIEW
LEAD PROFESSIONAL | DLF 5-10-12 | PROJECT MANAGER | RJR 5-10-12 | OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, SITE M1 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/18/2012

FIGURE 3-7

DRAWING NUMBER
2091115
05010401

USAEC — U.S. ARMY ENVIRONMENTAL COMMAND

TOLTEST, INC.

LEGEND

- MW104 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW105 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW640 (544.17) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW709 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 540 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 12 AND 13, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

north

QUALITY CONTROL | GRAPHIC STANDARDS | TECHNICAL REVIEW | MANAGEMENT REVIEW
LEAD PROFESSIONAL | PROJECT MANAGER | OTHER
DLF 5-10-12 | BAR 5-12-12 | BAR 5-18-12

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

POTENITOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M1 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

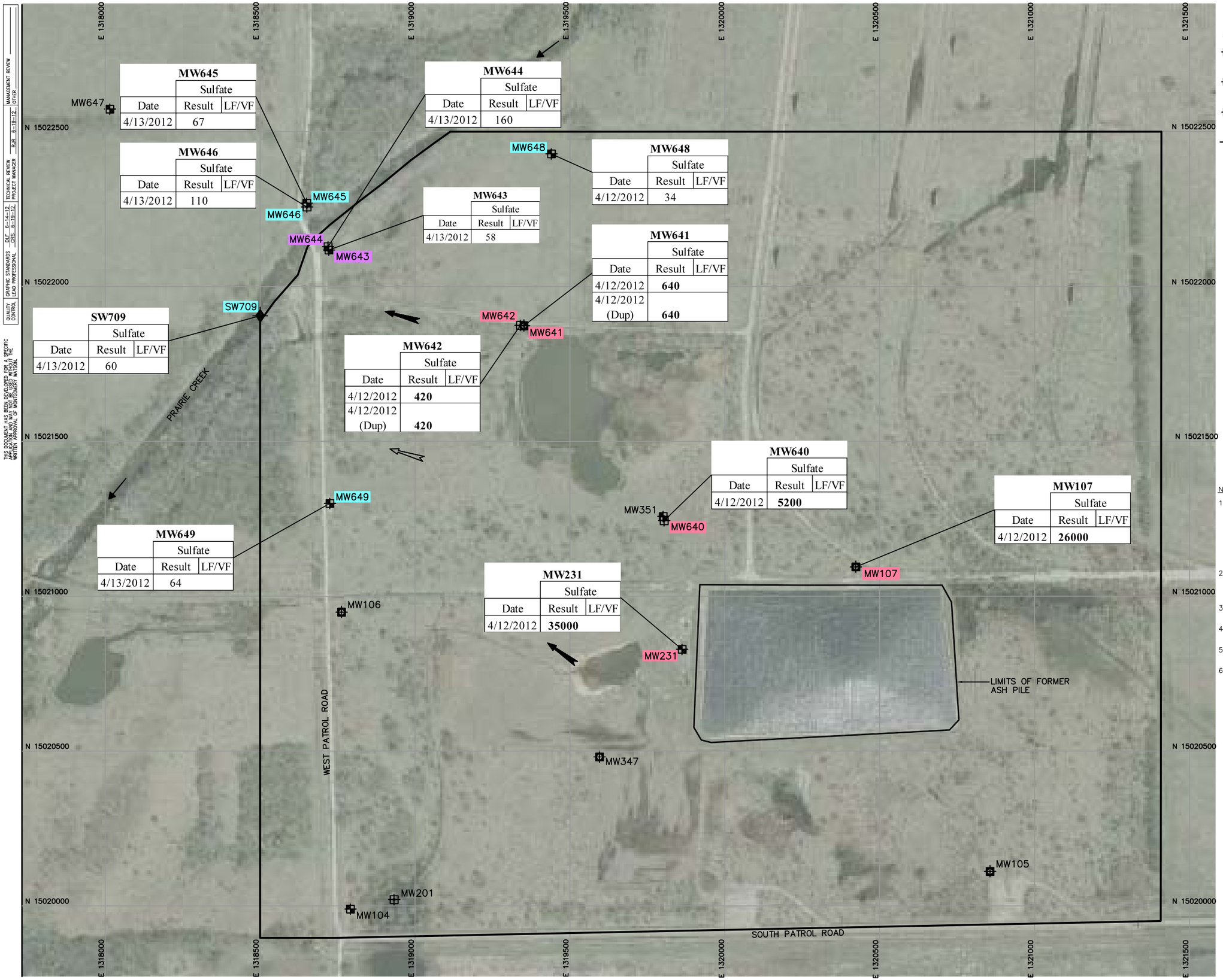
PRINTED
12/18/2012

FIGURE 3-8

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



MW645

	Sulfate	
Date	Result	LF/VF
4/13/2012	67	

MW644

	Sulfate	
Date	Result	LF/VF
4/13/2012	160	

MW646

	Sulfate	
Date	Result	LF/VF
4/13/2012	110	

MW648

	Sulfate	
Date	Result	LF/VF
4/12/2012	34	

MW643

	Sulfate	
Date	Result	LF/VF
4/13/2012	58	

MW641

	Sulfate	
Date	Result	LF/VF
4/12/2012	**640**	
4/12/2012 (Dup)	**640**	

SW709

	Sulfate	
Date	Result	LF/VF
4/13/2012	60	

MW642

	Sulfate	
Date	Result	LF/VF
4/12/2012	**420**	
4/12/2012 (Dup)	**420**	

MW640

	Sulfate	
Date	Result	LF/VF
4/12/2012	**5200**	

MW107

	Sulfate	
Date	Result	LF/VF
4/12/2012	**26000**	

MW649

	Sulfate	
Date	Result	LF/VF
4/13/2012	64	

MW231

	Sulfate	
Date	Result	LF/VF
4/12/2012	**35000**	

LEGEND

- MW648 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- MW641 — COMBINED MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- MW642 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- SW709 — SURFACE WATER MONITORING LOCATION, NUMBER, AND SULFATE DETECTIONS
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

DUP	DUPLICATE
LF/VF	LAB FLAG/VALIDATION FLAG
mg/L	MILLIGRAMS PER LITER
NS	NO STANDARD
RG	REMEDIATION GOAL

	Sulfate
Units	mg/L
Project Action Limit[(1)]	400
Surface Water RG	NS

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
5. CONCENTRATIONS REPORTED IN MILLIGRAMS PER LITER (mg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

MANAGEMENT REVIEW — OTHER
TECHNICAL REVIEW — PROJECT MANAGER — RJR 6-19-12
QUALITY CONTROL — GRAPHIC STANDARDS — LEAD PROFESSIONAL — DLF 6-14-12 — JDS 6-13-12

DEVELOPED BY: RJR — DRAWN BY: DLF — APPROVED BY — DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SULFATE DETECTIONS - MANUFACTURING AREA, SITE M1 (APRIL 2012)

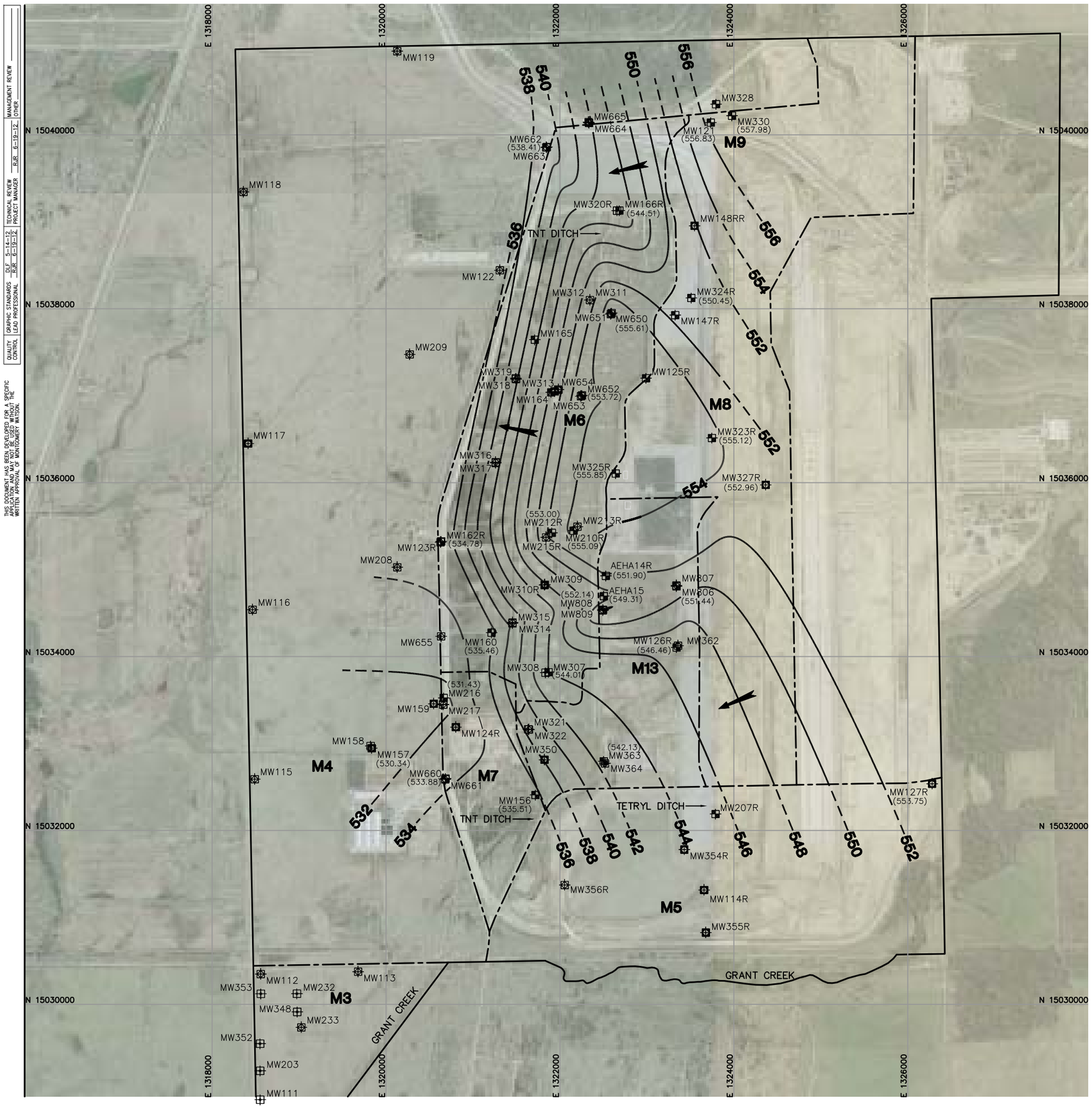
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/18/2012

FIGURE 3-9

DRAWING NUMBER
2091115
05010401

TOLTEST, INC



LEGEND

- MW325R (555.85) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW652 (553.72) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW356 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- (NM) — NOT MEASURED
- 550 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 2', DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL APRIL 13, 16, AND 17, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW117, MW127R, AND MW327R ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

	DLF	5-14-12
GRAPHIC STANDARDS	JMC	6-13-12
QUALITY CONTROL	LEAD PROFESSIONAL	
TECHNICAL REVIEW	PROJECT MANAGER	RJR 6-19-12
MANAGEMENT REVIEW	OTHER	

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

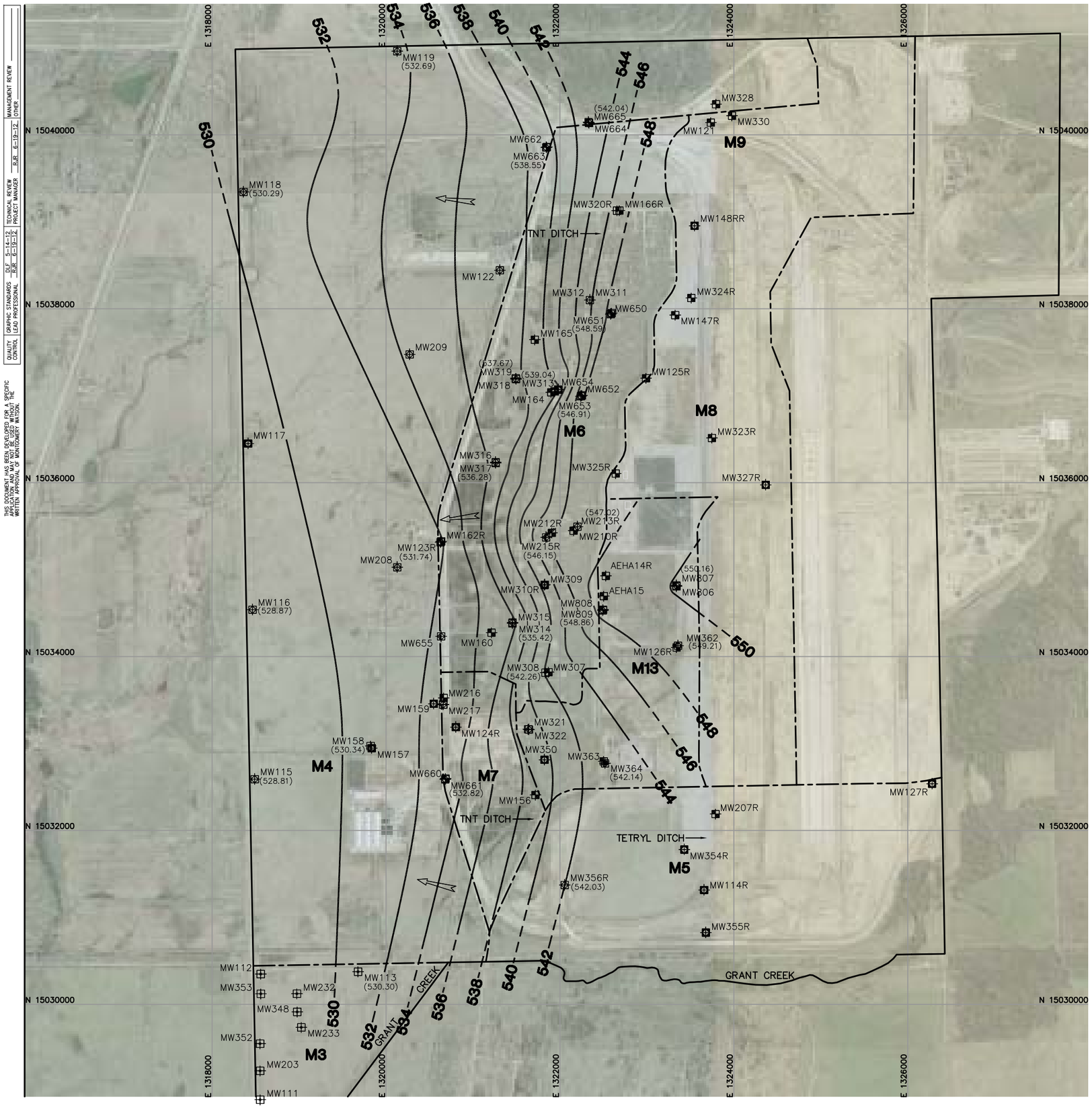
SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, MFG – SITES M4, M5, M6, M7, M8, M9, M13, AND OTHER AREAS (APRIL 2012)
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/19/2012

FIGURE 3-10

DRAWING NUMBER
2091115
05010401

JOLIET, INC.



LEGEND

- MW325R — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW350 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW356R (542.03) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW308 (542.26) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- (NM) — NOT MEASURED
- 540 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 2 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL APRIL 13, 16, AND 17, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

north

QUALITY CONTROL			MANAGEMENT REVIEW
GRAPHIC STANDARDS LEAD PROFESSIONAL	DLF 5-14-12	TECHNICAL REVIEW PROJECT MANAGER	
	JMC 6-13-12		BJR 6-19-12 OTHER

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, MFG – SITES M3, M4, M5, M6, M7, M8, M9, M13, AND OTHER AREAS (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

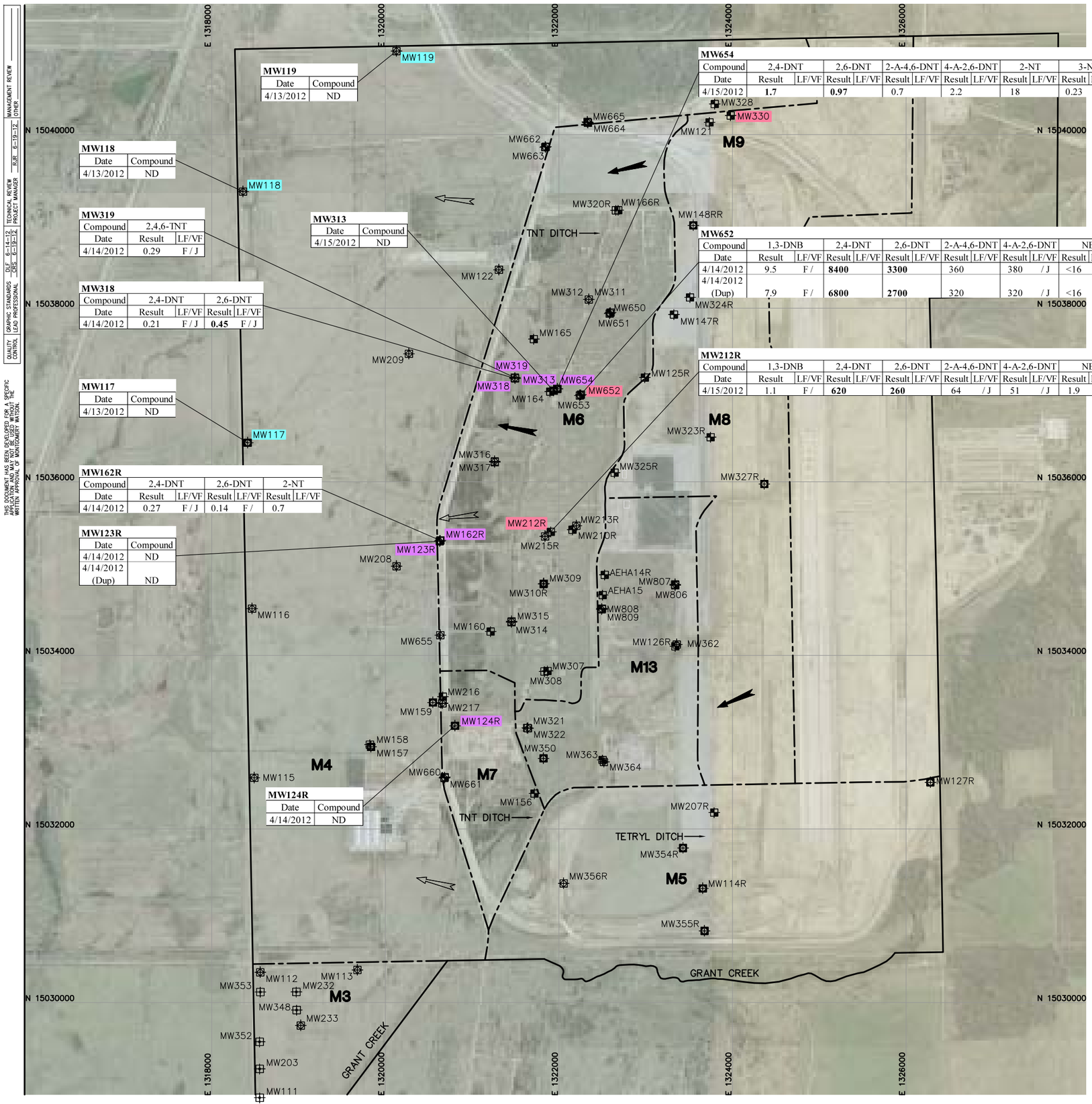
PRINTED 12/19/2012

FIGURE 3-11

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



MW119

Date	Compound
4/13/2012	ND

MW118

Date	Compound
4/13/2012	ND

MW313

Date	Compound
4/15/2012	ND

MW319

Compound	2,4,6-TNT	
Date	Result	LF/VF
4/14/2012	0.29	F / J

MW318

Compound	2,4-DNT		2,6-DNT	
Date	Result	LF/VF	Result	LF/VF
4/14/2012	0.21	F / J	**0.45**	F / J

MW117

Date	Compound
4/13/2012	ND

MW162R

Compound	2,4-DNT		2,6-DNT		2-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/14/2012	0.27	F / J	0.14	F /	0.7	

MW123R

Date	Compound
4/14/2012	ND
4/14/2012 (Dup)	ND

MW124R

Date	Compound
4/14/2012	ND

MW654

Compound	2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		3-NT		4-NT		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/15/2012	**1.7**		**0.97**		0.7		2.2		18		0.23	F / J	11		0.31	/ J	0.18	/ J

MW652

Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		NB		2-NT		4-NT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/14/2012	9.5	F /	**8400**		**3300**		360		380	/ J	<16		**44000**		28000		**1600**	
4/14/2012 (Dup)	7.9	F /	**6800**		**2700**		320		320	/ J	<16		**35000**		22000	/ J	**1300**	

MW212R

Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		NB		2-NT		4-NT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/15/2012	1.1	F /	**620**		**260**		64	/ J	51	/ J	1.9		4100		2100		**39**	

LEGEND

- MW212R — OVERBURDEN MONITORING WELL LOCATION NUMBER, AND EXPLOSIVES DETECTIONS
- MW124R — COMBINED MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW115 — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES
- < RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS

1,3-DNB	1,3-DINITROBENZENE
2,4,6-TNT	2,4,6-TRINITROTOLUENE
2,4-DNT	2,4-DINITROTOLUENE
2,6-DNT	2,6-DINITROTOLUENE
2-A-4,6-DNT	2-AMINO-4,6-DINITROTOLUENE
2-NT	2-NITROTOLUENE
3-NT	3-NITROTOLUENE
4-A-2,6-DNT	4-AMINO-2,6-DINITROTOLUENE
4-NT	4-NITROTOLUENE
NB	NITROBENZENE
RDX	ROYAL DEMOLITION EXPLOSIVE
DUP	DUPLICATE
F/	CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
/J	ESTIMATED CONCENTRATION
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit[1]	Surface Water RG
1,3-DNB	10	4
2,4,6-TNT	9.5	75
2,4-DNT	0.42	330
2,6-DNT	0.42	150
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS
NB	51	8000
RDX	2.6	500

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

QUALITY CONTROL | GRAPHIC STANDARDS | TECHNICAL REVIEW | MANAGEMENT REVIEW
LEAD PROFESSIONAL | DLF 6-13-12 | PROJECT MANAGER | RJR 6-19-12 | OTHER

DEVELOPED BY RJR | DRAWN BY DLF | APPROVED BY | DATE 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – MANUFACTURING AREA, MFG – SITES M6, M7, M9, AND OTHER AREAS (APRIL 2012)
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/19/2012

FIGURE 3-12

DRAWING NUMBER 2091115 05010401

USAEC

TOLTEST, INC.

LEGEND

- MW647 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW802 (536.73) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW334 (532.81) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- 530 — WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- STUDY AREA BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.
6. MW334 AND MW335 ARE SHALLOW BEDROCK WELLS, AND MW802 AND MW804 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

QUALITY CONTROL | GRAPHIC STANDARDS | DLF 5-14-12 | JBR 6-19-12 | TECHNICAL REVIEW | PROJECT MANAGER | JBR 6-19-12 | MANAGEMENT REVIEW | OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, SITE M11 LANDFILL (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
12/19/2012

FIGURE 3-13

DRAWING NUMBER
2091115
05010401

USAEC

JOLIET, INC.

LEGEND

- MW647 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW802 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW803 (540.27) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- 535 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- STUDY AREA BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.

north

QUALITY CONTROL | GRAPHIC STANDARDS | LEAD PROFESSIONAL | DLF 5-14-12 | JMC 6-19-12 | TECHNICAL REVIEW | PROJECT MANAGER | RJR 6-19-12 | MANAGEMENT REVIEW | OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE 0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M11 LANDFILL (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

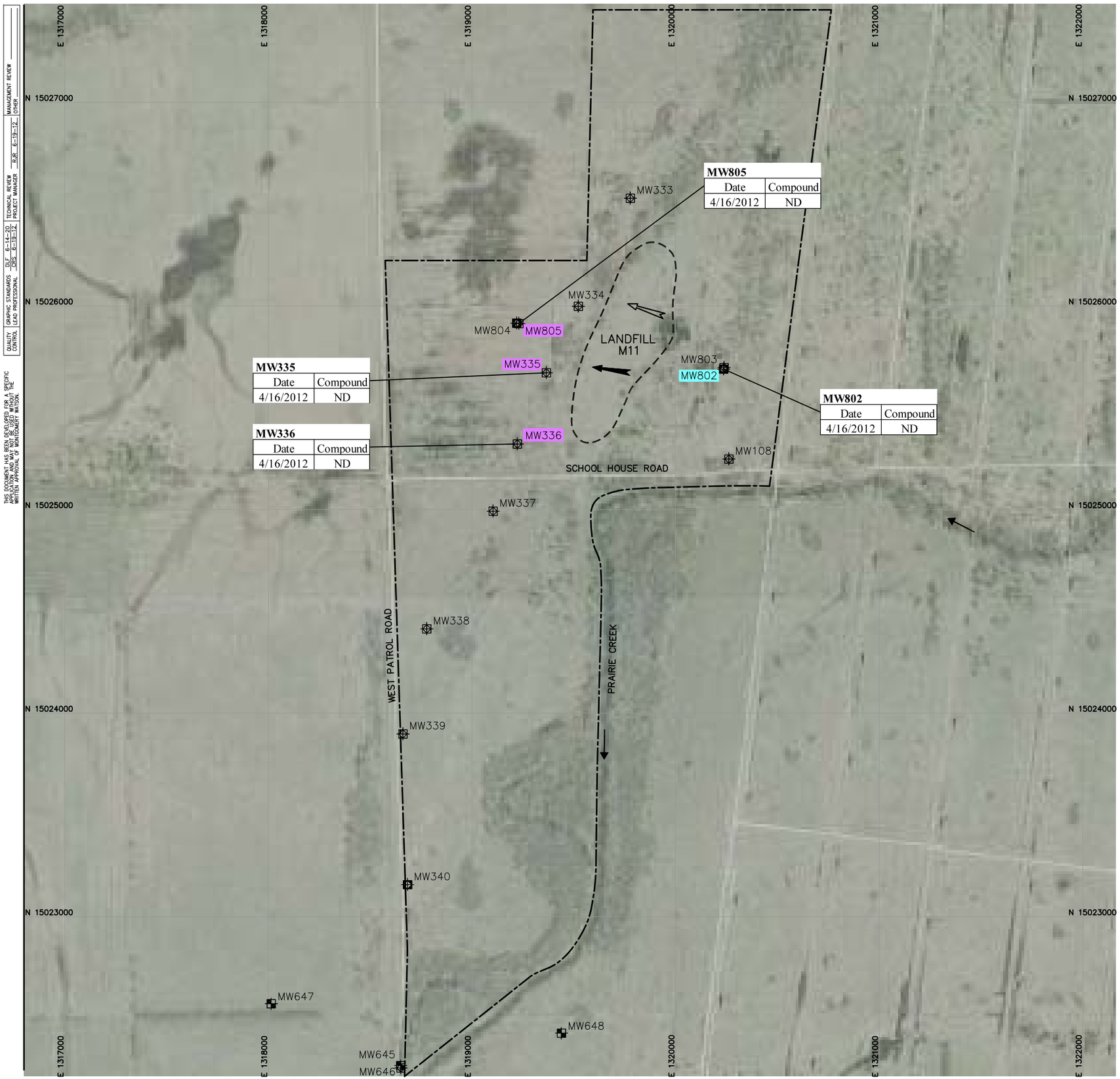
PRINTED 12/19/2012

FIGURE 3-14

DRAWING NUMBER 2091115 05010401

USAEC

TOLTEST, INC.



LEGEND

MW647	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW802	COMBINED MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW803	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
	DOWNGRADIENT MONITORING POINT
	UPGRADIENT MONITORING POINT
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF BEDROCK FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	STUDY AREA BOUNDARY
	APPROXIMATE LIMITS OF LANDFILL
ND	NOT DETECTED

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.

north

QUALITY CONTROL | GRAPHIC STANDARDS | TECHNICAL REVIEW | MANAGEMENT REVIEW
LEAD PROFESSIONAL | DLF 6-14-12 | PROJECT MANAGER | RJR 6-19-12 | OTHER

DEVELOPED BY RJR | DRAWN BY DLF | APPROVED BY | DATE 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS - MANUFACTURING AREA, SITE M11 LANDFILL (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

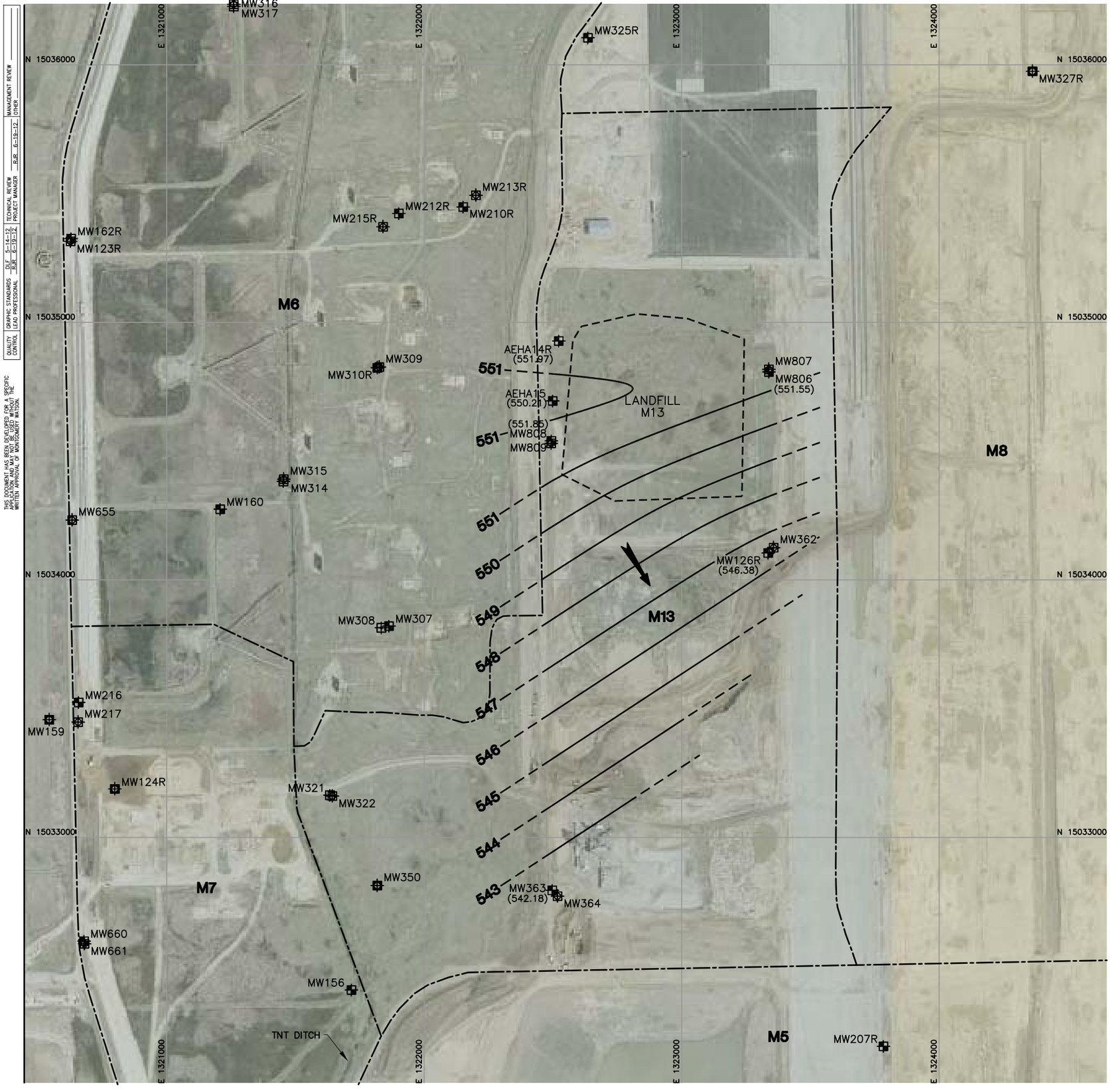
PRINTED 12/19/2012

FIGURE 3-15

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



LEGEND

MW126R (546.38)	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW356	SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
550	WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON FEBRUARY 29, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

QUALITY CONTROL | GRAPHIC STANDARDS | TECHNICAL REVIEW | MANAGEMENT REVIEW
LEAD PROFESSIONAL | DLF 5-14-12 | PROJECT MANAGER | BJR 6-19-12 | OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF
APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – FEBRUARY 2012)
MANUFACTURING AREA, SITE M13 LANDFILL
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT

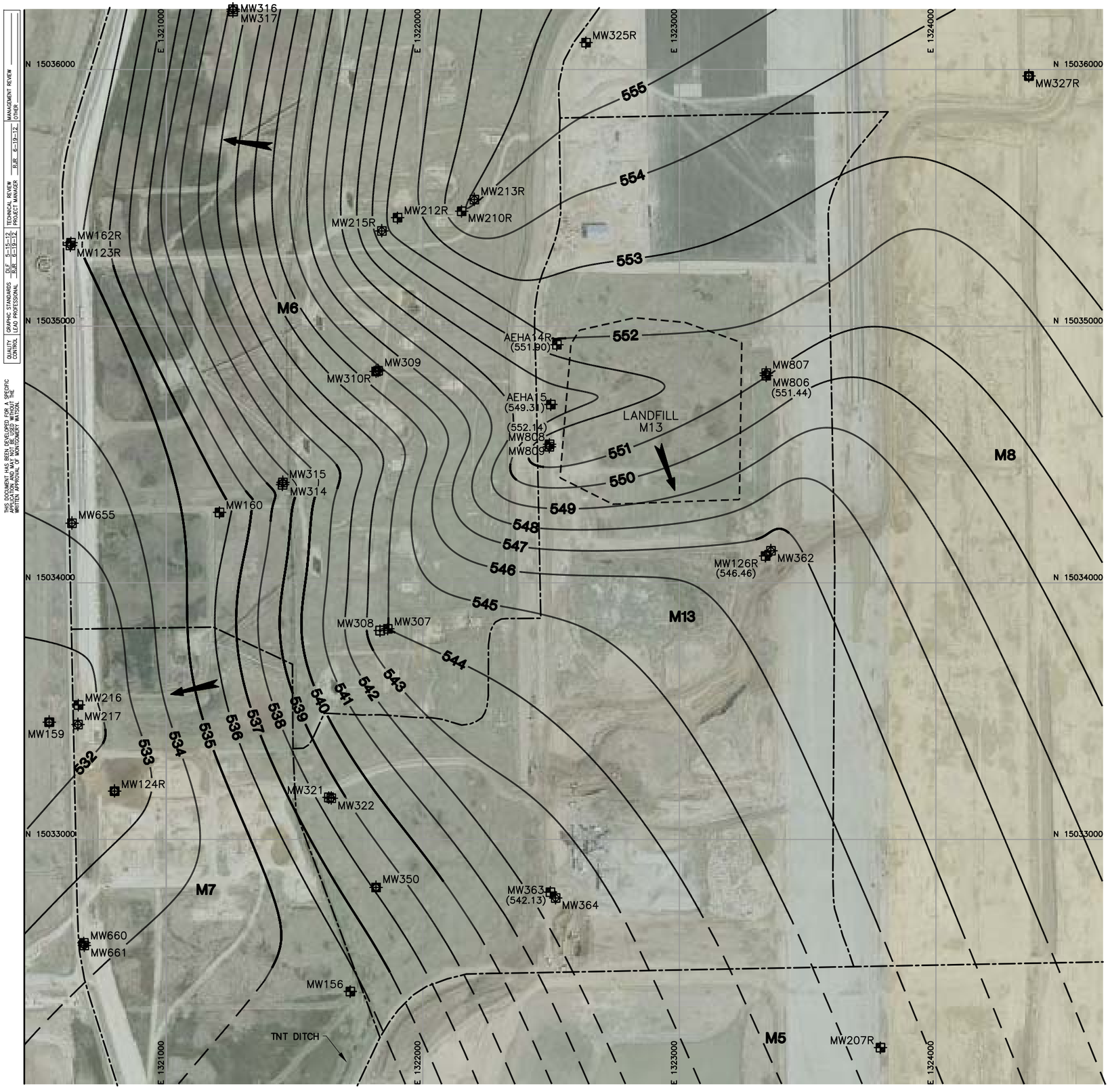
PRINTED
12/19/2012

FIGURE 3-16

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



LEGEND

- MW126R (546.46) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW350 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW356 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- 550 — WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- STUDY AREA BOUNDARIES
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. SEE FIGURE 3-10 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
6. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

QUALITY CONTROL | GRAPHIC STANDARDS LEAD PROFESSIONAL | DLF 5-15-12 | JLBR 6-19-12 | TECHNICAL REVIEW PROJECT MANAGER | JLBR 6-19-12 | MANAGEMENT REVIEW OTHER

DEVELOPED BY: RJR | DRAWN BY: DLF | APPROVED BY: | DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL

SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

WATER TABLE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
12/19/2012

FIGURE 3-17

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.

LEGEND

MW126R	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW362 (549.35)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
550	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON FEBRUARY 29, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

MANAGEMENT REVIEW OTHER
TECHNICAL REVIEW PROJECT MANAGER BJR 6-19-12
GRAPHIC STANDARDS DLF 5-15-12
QUALITY CONTROL LEAD PROFESSIONAL JMC 6-19-12

DEVELOPED BY R.JR
DRAWN BY DLF
APPROVED BY
DATE 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP - FEBRUARY 2012)
MANUFACTURING AREA, SITE M13 LANDFILL
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

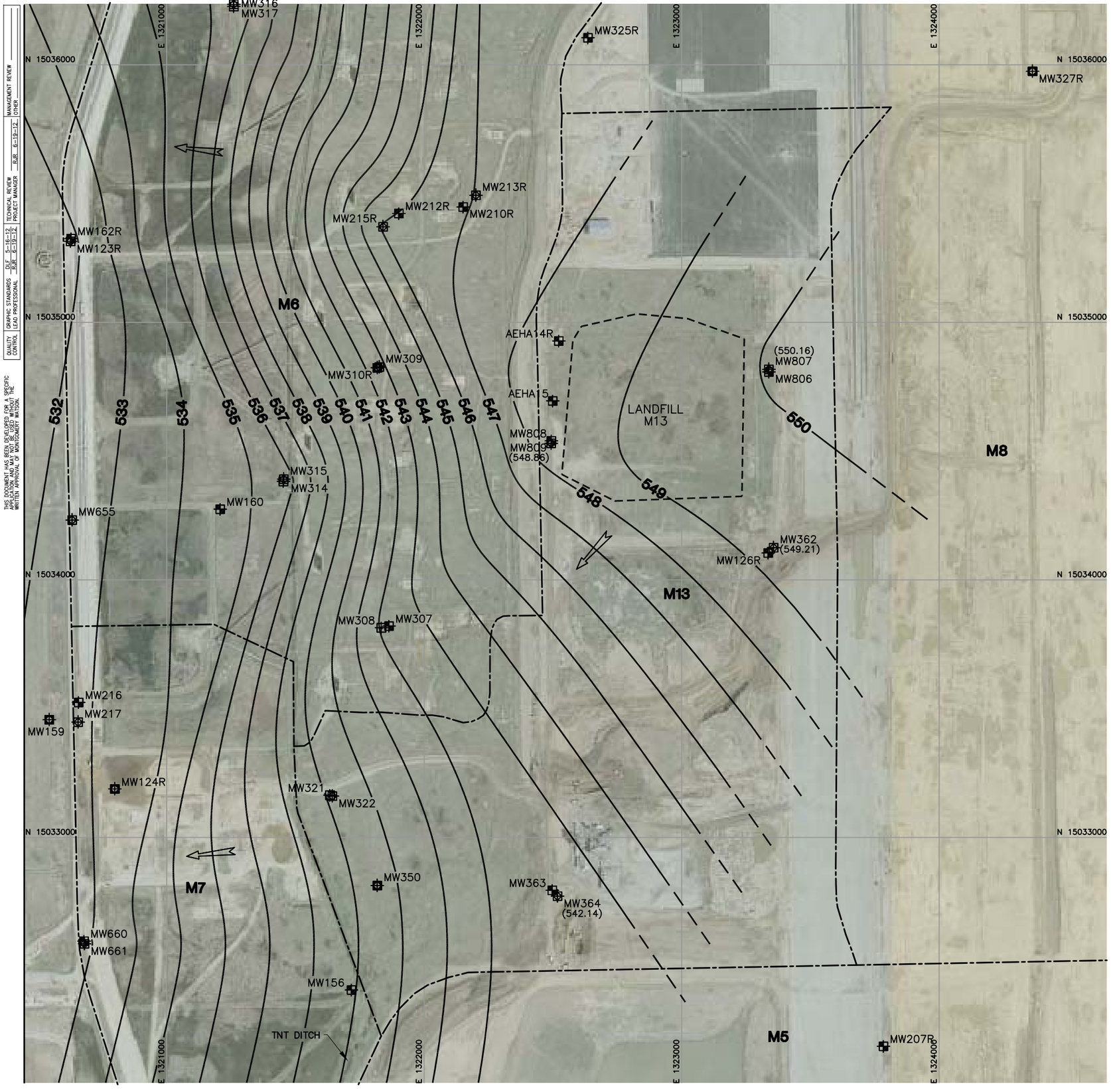
PRINTED 12/19/2012

FIGURE 3-18

DRAWING NUMBER 2091115 05010401

USAEC

TOLTEST, INC.



LEGEND

- MW126R — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW350 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW362 (549.21) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- 545 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- STUDY AREA BOUNDARIES
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. SEE FIGURE 3-11 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
6. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

MANAGEMENT REVIEW — OTHER
TECHNICAL REVIEW — PROJECT MANAGER — BJR 6-19-12
GRAPHIC STANDARDS — DLF 5-16-12 — LEAD PROFESSIONAL — JMS 6-13-12
QUALITY CONTROL

DEVELOPED BY: RJR — DRAWN BY: DLF
APPROVED BY — DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (APRIL 2012)
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

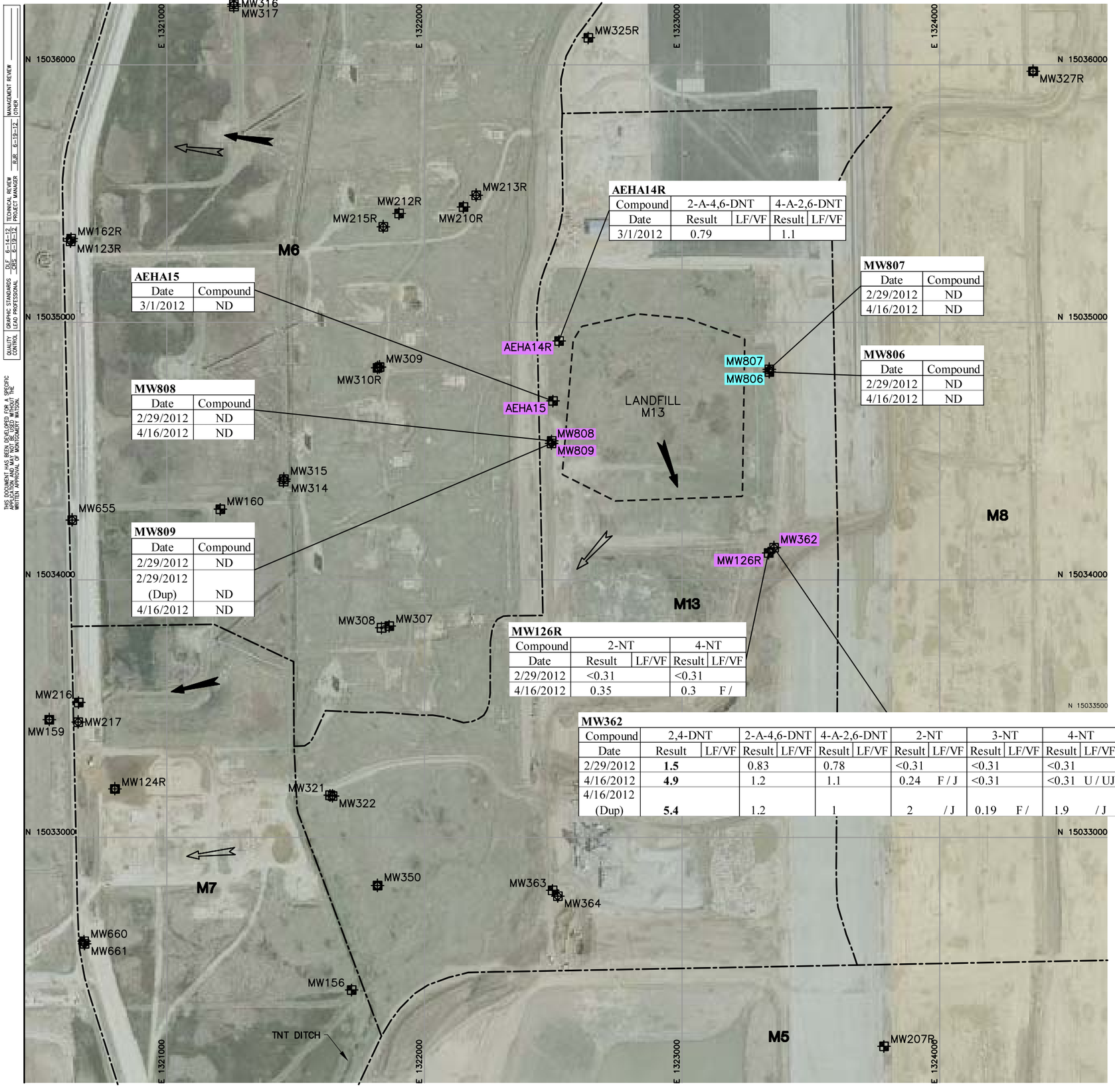
PRINTED 12/19/2012

FIGURE 3-19

DRAWING NUMBER
2091115
05010401

USAEC

TOLTEST, INC.



AEHA14R

Compound	2-A-4,6-DNT		4-A-2,6-DNT	
Date	Result	LF/VF	Result	LF/VF
3/1/2012	0.79		1.1	

AEHA15

Date	Compound
3/1/2012	ND

MW807

Date	Compound
2/29/2012	ND
4/16/2012	ND

MW806

Date	Compound
2/29/2012	ND
4/16/2012	ND

MW808

Date	Compound
2/29/2012	ND
4/16/2012	ND

MW809

Date	Compound
2/29/2012	ND
2/29/2012 (Dup)	ND
4/16/2012	ND

MW126R

Compound	2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF
2/29/2012	<0.31		<0.31	
4/16/2012	0.35		0.3	F /

MW362

Compound	2,4-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		3-NT		4-NT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	**1.5**		0.83		0.78		<0.31		<0.31		<0.31		<0.16	
4/16/2012	**4.9**		1.2		1.1		0.24	F / J	<0.31		<0.31	U / UJ	0.073	F /
4/16/2012 (Dup)	**5.4**		1.2		1		2	/ J	0.19	F /	1.9	/ J	0.097	F /

LEGEND

- MW126R — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW327R — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW362 — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- DOWNGRADIENT MONITORING POINT
- UPGRADIENT MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- STUDY AREA BOUNDARIES
- APPROXIMATE LIMITS OF LANDFILL

<	RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
2,4-DNT	2,4-DINITROTOLUENE
2,4,6-TNT	2,4,6-TRINITROTOLUENE
2-A-4,6-DNT	2-AMINO-4,6-DINITROTOLUENE
2-NT	2-NITROTOLUENE
3-NT	3-NITROTOLUENE
4-A-2,6-DNT	4-AMINO-2,6-DINITROTOLUENE
4-NT	4-NITROTOLUENE
DUP	DUPLICATE
F/	CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
/J	ESTIMATED CONCENTRATION
U/	NOT DETECTED
/UJ	ESTIMATED DETECTION LIMIT
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit[1]	Surface Water RG
2,4-DNT	0.42	330
2,4,6-TNT	9.5	75
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN FEBRUARY, MARCH, AND APRIL 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

MANAGEMENT REVIEW — OTHER
TECHNICAL REVIEW — PROJECT MANAGER — RJR 6-19-12
GRAPHIC STANDARDS — DLF 6-14-12 — JBS 6-19-12
QUALITY CONTROL — LEAD PROFESSIONAL

DEVELOPED BY: RJR
DRAWN BY: DLF
APPROVED BY:
DATE: 12/18/12

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – MANUFACTURING AREA, SITE M13 LANDFILL (2012)
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/19/2012

FIGURE 3-20

DRAWING NUMBER
2091115
05010401

TOLTEST, INC

APPENDIX A

LANDFILL INSPECTION REPORTS

A1 – LANDFILL INSPECTION REPORT – MARCH 2012
A2 – LANDFILL INSPECTION REPORT – APRIL 2012

A1 – LANDFILL INSPECTION REPORT – MARCH 2012

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

March 2012

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From – To)
03-1-2012	Technical	January to March 2012

4. TITLE AND SUBTITLE
Post-Closure Inspection Report for Landfills L3, M11 and M13 for the 2008 Performance-Based Acquisition for Environmental Remediation, Joliet Army Ammunition Plant, Joliet, Illinois

5a. CONTRACT NUMBER
W91ZLK-05-D-0012

5b. GRANT NUMBER
NA

5c. PROGRAM ELEMENT NUMBER
NA

6. AUTHOR(S)
TolTest, Inc.

5d. PROJECT NUMBER
Delivery Order 0001

5e. TASK NUMBER
NA

5f. WORK UNIT NUMBER
NA

PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
TolTest, Inc.
1480 Ford Street
Maumee, OH 44087

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDESS(ES)
USAEC - Louisville District
Aberdeen Proving Ground – W91ZLK
4118 Susquehanna Ave
Aberdeen Proving Ground, MD 21005-3013

10. SPONSOR/MONITOR'S ACRONYM(S)
CELRL-ED-EE

11. SPONSOR/MONITOR'S REPORT NUMBER
NA

12. DISTRIBUTION/AVAILABILITY STATEMENT
Reference Distribution Page

13. SUPPLEMENTARY NOTES
None.

14. ABSTRACT
This Post-Closure Inspection report presents TolTest's findings for the conditions at landfills L3, M11 and M13 pursuant to the requirements of the Performance-Based Contract for Environmental Remediation at the Joliet Army Ammunition Plant.

15. SUBJECT TERMS
Landfill, Inspection Report, L3, M11, M13

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18 NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (*Include area code)*

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18

DISCLAIMER STATEMENT

This report is a work prepared for the United States Government by TolTest. In no event shall either the United States Government or TolTest have any responsibility or liability for any consequences of any use, misuse, inability to use, or reliance on the information contained herein, nor does either warrant or otherwise represent in any way the accuracy, adequacy, efficacy, or applicability of the contents hereof.

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

Submitted to:

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1480 Ford Street
Maumee, OH 43537
(419) 794-3500

March 2012

DOCUMENT DISTRIBUTION
for the
Post-Closure Inspection Report for Landfills
L3, M11, and M13
for the Performance-Based Acquisition of
Environmental Remediation
Joliet Army Ammunition Plant
Joliet, Illinois

Organization	Distribution	
	Paper	Electronic
Joliet Army Ammunition Plant	**2**	**2**
Joliet Environmental Information Management System	**0**	**1**
United States Army Environmental Command	**1**	**2**
United States Army Corps of Engineers - Louisville District	**0**	**2**

TABLE OF CONTENTS

List of Attachments

LIST OF ACRONYMS

GMZ	Ground Water Monitoring Zone
IAC	Illinois Administrative Code
JOAAP	Joliet Army Ammunition Plant
L3	JOAAP Landfill L3
M11	JOAAP Landfill M11
M13	JOAAP Landfill M13
RA	Remedial Action
RG	Remedial Goal
USAEC	United States Army Environmental Command

POST-CLOSURE INSPECTION REPORT

1.0 Introduction

This document has been prepared for the United States Army Environmental Command to provide documentation of the conditions of three landfills (L3, M11, and M13) located at the former Joliet Army Ammunition Plant (JOAAP).

Post-closure monitoring requirements for Landfills L3, M11 and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 1 March 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
  - SW004 (Surface location where Prairie Creek first enters the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
  - MW410
  - MW412
  - MW630
  - MW631
  - MW633
  - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
  - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
  - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
  - MW802
  - MW803
- Downgradient Locations

- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

In April 2012 samples will be collected from wells MW802, MW335, MW336, and MW805 only.

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
  - MW806
  - MW807
- Crossgradient
  - MW126R
  - MW362
- Downgradient or source control wells

- MW808
- MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 1 March 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There was no evidence of damage due to burrowing animals. The vents were undamaged and appeared to be in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

- Repair rip rap along Prairie creek.

Landfill M11:

- None detected

Landfill M13:

- None detected.

Attachment A
Post-Closure Inspection Checklists

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M11		Date of Inspection: March 1, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?		√	Chained shut with no lock
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?		√	
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?		√	
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: March 1, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: L3		Date of Inspection: March 1, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?	√		
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal Burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?		√	
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?	√		Rip Rap on West side needs repairs
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: March 1, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M13		Date of Inspection: March 1, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a. Was fencing, gates and signs in good condition?	√		
b. Were gates locked?	√		New lock placed on gate.
c. Evidence of trespassing		√	
Landfill Cover			
d. Evidence of Settling and/or Ponding?		√	
e. Any desiccation or cracking detected?		√	
f. Erosion around cap?		√	
g. Animal burrowing detected?		√	
Vegetation Condition			
h. Is vegetation well established?	√		
i. Evidence of vegetation detrimental to cap?		√	
Landfill structures			
j. Evidence of damage to monitoring wells?		√	
k. Evidence of damage to gas vents?		√	
Field Conclusions			
l. Is there an imminent hazard to the integrity of the unit?		√	
m. Are repairs necessary?		√	
Certification			
Inspector Signature:		Printed Name: Gary Reside	
Title: Environmental Manager		Date: March 1, 2012	

Attachment B
Inspection Photographs

L3 West side looking South along Prairie Creek

L3 North side looking East

L3 East side looking South

L3 East side looking North

L3 South side looking West

M13 SW corner looking East

M13 locked gate

M13 NW corner looking SE

M13 top of cap looking SE

M13 top of cap looking East

M13 East side looking North

M11 South side looking NW

M11 SE corner looking North

M11 top of cap looking North.

M11 top of cap looking West.

M11 North side looking West.

M11 East side looking South

A2 - LANDFILL INSPECTION REPORT – APRIL 2012

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

April 2012

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From – To)
06-20-2012	Technical	April to June 2012

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Post-Closure Inspection Report for Landfills L3, M11 and M13 for the 2008 Performance-Based Acquisition for Environmental Remediation, Joliet Army Ammunition Plant, Joliet, Illinois	W91ZLK-05-D-0012
	5b. GRANT NUMBER NA
	5c. PROGRAM ELEMENT NUMBER NA
6. AUTHOR(S) TolTest, Inc.	**5d. PROJECT NUMBER** Delivery Order 0001
	5e. TASK NUMBER NA
	5f. WORK UNIT NUMBER NA

PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
TolTest, Inc. 1480 Ford Street Maumee, OH 44087	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDESS(ES) USAEC - Louisville District Aberdeen Proving Ground – W91ZLK 4118 Susquehanna Ave Aberdeen Proving Ground, MD 21005-3013	**10. SPONSOR/MONITOR'S ACRONYM(S)** CELRL-ED-EE
	11. SPONSOR/MONITOR'S REPORT NUMBER NA

12. DISTRIBUTION/AVAILABILITY STATEMENT
Reference Distribution Page

13. SUPPLEMENTARY NOTES
None.

14. ABSTRACT
This Post-Closure Inspection report presents TolTest's findings for the conditions at landfills L3, M11 and M13 pursuant to the requirements of the Performance-Based Contract for Environmental Remediation at the Joliet Army Ammunition Plant.

15. SUBJECT TERMS
Landfill, Inspection Report, L3, M11, M13

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18 NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (*Include area code)*

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18

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POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

April 2012

DOCUMENT DISTRIBUTION
for the
Post-Closure Inspection Report for Landfills
L3, M11, and M13
for the Performance-Based Acquisition of
Environmental Remediation
Joliet Army Ammunition Plant
Joliet, Illinois

Organization	Distribution	
	Paper	Electronic
Joliet Army Ammunition Plant	**2**	**2**
Joliet Environmental Information Management System	**0**	**1**
United States Army Environmental Command	**1**	**2**
United States Army Corps of Engineers - Louisville District	**0**	**2**

TABLE OF CONTENTS

List of Attachments

LIST OF ACRONYMS

GMZ	Ground Water Monitoring Zone
IAC	Illinois Administrative Code
JOAAP	Joliet Army Ammunition Plant
L3	JOAAP Landfill L3
M11	JOAAP Landfill M11
M13	JOAAP Landfill M13
RA	Remedial Action
RG	Remedial Goal
USAEC	United States Army Environmental Command

POST-CLOSURE INSPECTION REPORT

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- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 18 April 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
  - SW004 (Surface location where Prairie Creek first touches the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
  - MW410
  - MW412
  - MW630
  - MW631
  - MW633
  - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
  - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
  - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
  - MW802
  - MW803
- Downgradient Locations

- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

In April 2012 samples were collected from wells MW802, MW335, MW336, and MW805 only.

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
  - MW806
  - MW807
- Cross Gradient
  - MW126R
  - MW362

- Downgradient or source control wells
  - MW808
  - MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 18 April 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There was no evidence of damage due to burrowing animals. The vents were undamaged and appeared to be in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

- Repair rip rap along Prairie creek. The Army is currently preparing the contract documentation necessary for implementation of the repairs.
- Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Landfill M11:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Landfill M13:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Attachment A
Post-Closure Inspection Checklists

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M11		Date of Inspection: April 18, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?		√	Chained shut with no lock
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?		√	
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: April 18, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: L3		Date of Inspection: April 18, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?	√		
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal Burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?	√		Rip Rap on West side needs repairs
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: April 18, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M13		Date of Inspection: April 18, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a. Was fencing, gates and signs in good condition?	√		
b. Were gates locked?	√		New lock placed on gate.
c. Evidence of trespassing		√	
Landfill Cover			
d. Evidence of Settling and/or Ponding?		√	
e. Any desiccation or cracking detected?		√	
f. Erosion around cap?		√	
g. Animal burrowing detected?		√	
Vegetation Condition			
h. Is vegetation well established?	√		
i. Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j. Evidence of damage to monitoring wells?		√	
k. Evidence of damage to gas vents?		√	
Field Conclusions			
l. Is there an imminent hazard to the integrity of the unit?		√	
m. Are repairs necessary?		√	
Certification			
Inspector Signature:		Printed Name: Gary Reside	
Title: Environmental Manager		Date: April 18, 2012	

Attachment B
Inspection Photographs

L3 West side looking South.

L3 North side looking East

L3 East side of landfill

L3 East side of landfill

M11 South side looking North.

M11 West side looking Northeast.

M11 West side looking North.

M11 Top of cap looking North.

M11 East side looking North.

M13 Top of cap looking East.

M13 East side looking South.

M13 East side looking North.

M13 South side looking East.

M13 South side looking West.

APPENDIX B

DATA REPORTS

B1 – DATA USABILITY REPORT
B2 – DATA VALIDATION REPORTS – LABORATORY DATA CONSULTANTS (LDC)

B1 - DATA USABILITY REPORT

APPENDIX B1

DATA USABILITY REPORT
GROUNDWATER AND SURFACE WATER SAMPLING
FEBRUARY AND APRIL 2012

JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting – AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

April 2013

DATA USABILITY REPORT

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ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
CCB	continuing calibration blank
CCV	continuing calibration verification
GC/MS	gas chromatography/mass spectroscopy
ICAL	initial calibration
ICB	initial calibration blank
ICS	interference check sample
ICV	initial calibration verification
J	estimated value
JOAAP	Joliet Army Ammunition Plant
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LDC	Laboratory Data Consultants
MD	matrix duplicate (metals)
mg/L	milligrams per liter
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
MWH	MWH Americas, Inc.
ORP	oxidation/reduction potential
QA	quality assurance
QC	quality control
R	analytical result is unusable
RPD	relative percent difference
SDG	sample delivery group
SVOCs	semivolatile organic compounds
TAL	target analyte list
Test America	Test America Laboratories, Inc.
ug/L	micrograms per liter
U	analyte analyzed for but not detected
UJ	analyte is not detected estimated quantitation limit
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

APPENDIX B1

DATA USABILITY SUMMARY

1.0 INTRODUCTION

The following data usability summary discusses quality assurance/quality control (QA/QC) outliers for each analyte group per sampling round. Data qualifiers were added to results and imported into the Joliet Army Ammunition Plant (JOAAP) database. Data qualifiers used in the validation process may include the following:

- U – Not detected. This validation qualifier was added if there was blank contamination and the sample concentration was less than five times the blank concentration (ten times for common organic contaminants methylene chloride, acetone, phthalates)
- J – Estimated value. This validation qualifier was added if the reported concentration is estimated.
- UJ – Not detected, estimated quantitation limit. This validation qualifier was added if the analyte was not detected but QA/QC parameters were not met.
- R – Unusable data. This validation qualifier was added if the analyte was not detected but QA/QC parameters were not met and were extremely low (i.e. less than 10% recovery for laboratory control samples (LCS) or surrogate recoveries)

Test America Laboratories, Inc. (Test America) located at 2417 Bond Street, University Park, Illinois performed the analyses of groundwater and surface water samples collected in February and April 2012 at the JOAAP located in Wilmington, Illinois. Groundwater was collected from site M13 Landfill and analyzed for the following parameters in February 2012:

- Volatile organic compounds (VOCs) were analyzed by SW846 Method 8260B.
- Semivolatile organic compounds (SVOCs) were analyzed by SW846 Method 8270C.
- Explosives were analyzed by SW846 Method 8330.
- Target analyte list (TAL) metals were analyzed by SW846 Methods 6010B and 7470A (mercury).
- Sulfate was analyzed by United States Environmental Protection Agency (USEPA) Method 300.0.
- Nitrate was analyzed by USEPA Method 300.0.

Groundwater was collected from nine sites and analyzed for the following parameters in April 2012:

- VOCs were analyzed by SW846 Method 8260B at Sites M3, M11 Landfill and M13 Landfill.

- SVOCs were analyzed by SW846 Method 8270C at Sites M11 Landfill and M13 Landfill.
- Explosives were analyzed by SW846 Method 8330 at Sites M5, M6, M7, L1, L2, L3, L14, OA, L3 Landfill, M11 Landfill, and M13 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L2, L3, L3 Landfill, M11 Landfill, and M13 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Sites M1, M8, M9, M11 Landfill and M13 Landfill.
- Nitrate was analyzed by USEPA Method 300.0 at Sites M11 Landfill and M13 Landfill.

Surface water was collected from three sites at JOAAP and analyzed for the following parameters:

- Explosives were analyzed by SW846 Method 8330 at Sites L1, L2, L3, and L3 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L1 and L3 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Site M1.

Field parameters are not discussed in this data usability report, but were recorded by field personnel with a water quality meter at the time of sample collection and included:

- pH, temperature, specific conductivity, dissolved oxygen, turbidity, and oxidation/reduction potential (ORP)

The following summarizes the sample delivery group (SDG) and corresponding data validation report:

Sample Delivery Group	**Data Validation Report Number**	**Associated Samples**
500-44539-1	27391	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999
500-44555-1	27391	JP-M13-GWAEHA14R JP-M13-GWAEHA15
500-45420-1	27595	JP-L1-GWMW173-0412 JP-L1-GWMW174-0412 JP-L1-GWMWWES3-0412 JP-L3-GWMW410-0412 JP-L3-GWMW412-0412 JP-L3-GWMW630-0412

Sample Delivery Group	Data Validation Report Number	Associated Samples
		JP-L3-GWMW631-0412 JP-L3-GWMW633-0412 JP-L3-GWMW999-0412 JP-L3-SW557-0412 JP-L3-SW558-0412 JP-L3-SW777-0412
500-45457-1	27605	JP-L3-SW004-0412 JP-M1-GWMW648-0412 JP-M1-GWMW998-0412 JP-M1-GWMW641-0412 JP-M1-GWMW997-0412 JP-M1-GWMW642-0412 JP-M1-GWMW640-0412 JP-M1-GWMW107-0412 JP-M1-GWMW231-0412 JP-M1-GWMW645-0412 JP-M1-GWMW646 JP-M1-GWMW649 JP-M1-GWMW644 JP-M1-GWMW643 JP-M1-SW709 JP-L1-GWMW131 JP-L1-GWWES1 JP-L1-SW550 JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117
500-45518-1	27469	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999
500-45519-1	27649	JP-M06-GWMW654 JP-M11-GWMW335 JP-M11-GWMW336 JP-M11-GWMW802 JP-M11-GWMW805 JP-M9-GWMW330
500-45521-1	27649	JP-M06-GWMW123R JP-M06-GWMW162R JP-M06-GWMW212R

Sample Delivery Group	Data Validation Report Number	Associated Samples
		JP-M06-GWMW313 JP-M06-GWMW318 JP-M06-GWMW319 JP-M06-GWMW652 JP-M06-GWMW994 JP-M06-GWMW995 JP-M07-GWMW124R

2.0 LABORATORY QA/QC ELEMENTS

Laboratory Data Consultants, Inc. (LDC) located at 7750 El Camino Real, Suite 2L, Carlsbad, California performed the equivalent of USEPA Level III validation on 100% of the data using the JOAAP Quality Assurance Project Plan (QAPP) for Long Term Monitoring, a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, and the Department of Defense Quality Systems Manual for Environmental Laboratories validation guidelines, as appropriate. QAPP Worksheets # 34, #35, and #36 describe the verification process and QAPP Worksheet #37 describes the data usability assessment.

Data were evaluated for precision, accuracy, representativeness, comparability, and completeness based on results of the following QA/QC samples and parameters, where applicable:

- Sample preservation
- Sample holding times
- Surrogate spikes (organics)
- Laboratory control sample (LCS/LCSD)
- Matrix spike/matrix spike duplicate (MS/MSD)
- Matrix duplicate (MD) for metals
- Laboratory duplicate samples
- Gas chromatography/mass spectroscopy (GC/MS) tunes (organics)
- Internal standards (organics)
- Initial calibration (ICAL) standards
- Initial calibration verification (ICV) standards
- Continuing calibration verification (CCV) standards
- Interference check samples (ICSs) (metals)
- Trip blanks (VOCs)
- Serial dilution (metals)
- Method blanks
- Initial calibration blanks (ICBs)
- Continuing calibration blanks (CCBs)

The following field QA/QC samples were collected and analyzed:

- One field duplicate per 10 field samples collected
- One MS/MSD (extra sample volume) per 20 field samples collected
- Trip blanks included with each cooler containing VOC samples.

Samples were stored in coolers on wet ice, transported, and hand delivered to the analytical laboratory under chain-of-custody documentation.

3.0 EVALUATION OF MEASUREMENT QUALITY OBJECTIVES

For each analytical method, laboratory QA/QC results were compared to the established acceptance limits. The parameters reviewed for each are outlined in the following subsections.

3.1 PRECISION

Precision was quantitatively evaluated by reviewing the relative percent differences (RPDs) for the following QA/QC samples:

- MS/MSDs
- Matrix duplicate (metals)
- LCS/LCSDs
- Laboratory duplicate samples
- Serial dilution (metals)
- Field duplicate samples

Refer to Worksheet #12 (Method Performance Criteria Table) and Worksheet #28 (QC Samples Table) for QC samples analyzed and criteria limits.

3.1.1 February 2012

VOCs – VOCs precision QA/QC were acceptable.

SVOCs – SVOCs precision QA/QC were acceptable with the exception of the LCS/LCSD RPD for benzidine (27%), benzoic acid (116%), 2-nitroaniline (25%), and 4-nitrophenol (27%) were outside the acceptable limit and was qualified "UJ" as not detected, estimated quantitation limit in sample JP-M13-GWMWAEHA14R.

Explosives – Explosives precision QA/QC were acceptable.

TAL Metals – TAL metals precision QA/QC were acceptable with the exception of the serial dilution in sample M13LMWAEHA14R for potassium (12%). Potassium was qualified "J" as estimated in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

Sulfate – Sulfate precision QA/QC were acceptable.

Nitrate – Nitrate precision QA/QC were acceptable.

3.1.2 April 2012

VOCs – VOCs precision QA/QC were acceptable.

SVOCs – SVOCs precision QA/QC were acceptable with the exception of the MS/MSD (JP-M13-GWMW126R) RPD for n-nitrosodimethylamine (65%) and benzoic acid (32%). N-nitrosodimethylamine and benzoic acid were not detected in the subject sample, therefore, no qualifiers were added to the data.

The ICV %RSDs were outside the acceptable limit for the following compounds:

- N-nitrosodimethylamine (33.0%)
- 3&4-methylphenol (19.0%)
- dibenzofuran (17.0%)
- Di-n-butylphthalate (17.0%)
- Benzo(k)fluoranthene (22.0%)

If the above listed compound was detected in a sample listed below, it was qualified "J" as estimated.

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- JP-M11-GWMW335
- JP-M11-GWMW802
- JP-M11-GWMW805

The ICV %RSDs associated with sample JP-M11-GWMW336 were outside the acceptable limit for the following compounds:

- Benzoic acid (55.0%)
- 2,4-dinitrophenol (19.0%)

If detected, the compound was qualified "J" as estimated.

Explosives – Explosives precision QA/QC were acceptable with the following exceptions discussed below.

The difference between detected results between parent sample JP-M13-GWMW362 and duplicate sample JP-M13-GWMW999 were greater than the acceptable limits for

2-nitrotoluene (1.76 micrograms per liter [ug/L]) and 4-nitrotoluene (1.59 ug/L). Detections of these compounds for these two samples were flagged as "J" for estimated.

TAL Metals – TAL metals precision QA/QC were acceptable.

Sulfate – Sulfate precision QA/QC were acceptable.

Nitrate – Nitrate precision QA/QC were acceptable.

3.2 ACCURACY

Accuracy was quantitatively evaluated by comparing the percent recovery (%R) or percent difference (%D) for the following QA/QC samples or parameters:

- Surrogate spikes (VOCs and SVOCs)
- Internal standards (VOCs and SVOCs)
- ICVs
- CCVs
- MS/MSDs
- LCSs
- ICSs (metals)

Refer to Worksheet #12 (Method Performance Criteria Table) and Worksheet #28 (QC Samples Table) for QC samples analyzed and criteria limits.

3.2.1 February 2012

VOCs – The CCV %D was outside the acceptable limit for 2-butanone (24.9%), trans-1,3-dichloropropene (22.5%), 2-hexanone (34.4%), hexachlorobutadiene (28.5%), and 1,2,3-trichlorobenzene (32.3%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank

The CCV %D was outside the acceptable limit for dichlorodifluoromethane (25.8%), vinyl acetate (20.3%), cis-1,3-dichloropropene (27.3%), 4-methyl-2-pentanone (26.8%), 1,1,1-trichloroethane (32.9%), 1,1,2-trichloroethane (22.5%), 2-hexanone (29.6%), 1,2-dibromomethane (24.6%), 1,1,2,2-tetrachloroethane (21.9%), n-propylbenzene (23.5%), hexachlorobutadiene (30.6%), and 1,2,3-trichlorobenzene (32.5%). These

compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The second source calibration standard %Ds were outside the acceptable limit for chloromethane (21.7%) and dichlorodifluoromethane (27.6%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The MS/MSD (JP-M13-GWMW808) %Rs were outside acceptable limits for the following compounds:

- Vinyl acetate (123% MS)
- 2-hexanone (131% MSD)
- 1,1,2-trichloroethane (131%, 129%)

These compounds were not detected and therefore qualification was not required..

The LCS %R for 1,1,2-trichloroethane (129%) was above the acceptable limit. This compound (1,1,2-trichloroethane) was not detected in the associated samples, therefore qualification was not necessary.

The LCS %R for vinyl acetate (125%) was above the acceptable limit. Vinyl acetate was not detected in associated samples and no qualifiers were added to the data.

SVOCs – The CCV %Ds were outside the acceptable limits for the following compounds:

- 4-chlorophenyl-phenyl ether (20.2%)
- 2,4-dimethylphenol (21.5%)
- 2-methylnaphthalene (23.4%)
- 2,4,6-trichlorophenol (22.2%)
- 2-chloronaphthalene (20.6%)
- Acenaphthene (20.5%)

- 2,4-dinitrophenol (25.8%)
- 4-nitrophenol (20.5%)
- Fluorine (22.1%)
- N-nitrosodiphenylamine (23.8%)
- Hexachlorobenzene (24.0%)
- Phenanthrene (21.9%)
- Anthracene (21.7%)
- Carbazole (20.5%)
- Benzo(a)anthracene (21.8%)

These compounds were not detected and therefore were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The ICV %D was outside the acceptable limit for 3&4-methylphenol (17.0%), benzoic acid (25.0%), fluorine (16.0%), butylbenzylphthalate (18.0%), bis(2-ethylhexyl)phthalate (20.0%), and benzo(k)fluoranthene (19.0%). None of these compounds were detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The second source calibration standard %Ds were outside the acceptable limit for bis(2-chloroethyl)ether (25.5%). This compound was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The MS/MSD %Rs were outside the acceptable limits for the following compounds:

- Benzo(a)pyrene (116% MS, 120% MSD)
- Di-n-octylphthalate (141% MSD)

These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the associated sample JP-M13-GWMW808.

The surrogate spike %R recoveries were all acceptable with the exception of 2-fluorophenol (3%), phenol-d5 (7%), nitrobenzene (5%), and 2-fluorophenol (38%) associated with SDG 500-44555-1 in sample JP-M13-GWAEHA14R. All detected compounds associated with these surrogates were qualified as R and non-detect results were flagged as "J" in the following associated samples. However, this sample were re-run and surrogate recoveries were acceptable. As a result, the re-run analyses were reported as estimated.

Internal standard areas and retention times were acceptable.

Explosives – Explosives accuracy QA/QC were acceptable with the following exceptions.

The MS/MSD %Rs were outside the acceptable limits for the following compounds:

- HMX (133% MS, 134% MSD)
- 1,3,5-Trinotrobenzene (142% MS)
- 4-Nitrotoluene (137% MS, 137% MSD)

These compounds, associated with sample JP-M13-GWMW808, were not detected and no qualifiers were necessary.

TAL Metals – TAL Metals accuracy QA/QC were acceptable

Sulfate – Sulfate accuracy QA/QC were acceptable

Nitrate – Nitrate accuracy QA/QC were acceptable.

3.2.2 April 2012

VOCs - The %Ds in the CCV were outside the acceptable limit for the following compounds:

- Isopropylbenzene (20.4%)

Isopropylbenzene was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- JP-M11-GWMW335
- JP-M11-GWMW336
- JP-M11-GWMW802
- JP-M11-GWMW805
- Trip Blanks

SVOCs - The %Ds in the CCV were outside the acceptable limit for the following compounds:

- 2-methylnaphthalene (20.3%)
- dibenzofuran (21.3%)
- Di-n-butylphthalate (20.5%)

The above compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

The %Ds in the CCV were outside the acceptable limit for the following compounds:

- N-nitrosodimethylamine (41.8%)
- Benzoic acid (44.4%)
- 2,4-dinitrophenol (32.5%)
- 4-nitrophenol (25.6%)

The above compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M11-GWMW336

The second source calibration standard %Ds were outside the acceptable limit for 2-methylnaphthalene (20.3%), dibenzofuran (21.3%), and di-n-butylphthalate (20.5%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M11-GWMW802
- JP-M11-GWMW805
- JP-M11-GWMW335

The second source calibration standard %Ds was outside the acceptable limit for benzoic acid (125.4%). This compound was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M11-GWMW336

Explosives – The CCV %D for n-nitrotoluene (17.5%) was outside the acceptable limits. When not detected, n-nitrotoluene was qualified "UJ" and "J" for detected results in the following samples associated with SDG 500-45457-1:

- JP-OA-GWMW118
- JP-OA-GWMW119
- JP-OA-GWMW117

The CCV %D for 2,4,6-trinitrotoluene (16.6%) was outside the acceptable limits. Non-detect sample results were qualified "UJ" and samples with detection were qualified "J" in the following sample associated with SDG 500-45518-1 and 500-45519-1:

- JP-M13-GWMW807
- JP-M06-GWMW654
- JP-M11-GWMW335
- JP-M11-GWMW336
- JP-M11-GWMW802
- JP-M11-GWMW805

The LCS %R for HMX (116%) was above the acceptable limit. HMX detections were flagged with "J" for the following samples were detected:

- JP-L1-GWMW173-0412
- JP-L1-GWMW174-0412
- JP-L1-GWMWWES3-0412
- JP-L3-GWMW410-0412
- JP-L3-GWMW412-0412
- JP-L3-GWMW630-0412
- JP-L3-GWMW631-0412
- JP-L3-GWMW633-0412
- JP-L3-GWMW999-0412
- JP-L3-SW557-0412
- JP-L3-SW558-0412
- JP-L3-SW777-0412
- JP-L1-GWMW131
- JP-L1-GWWES1

- JP-L1-SW550
- JP-OA-GWMW118
- JP-OA-GWMW119
- JP-OA-GWMW117
- JP-L3-SW004-0412

The %D between the duel columns for samples with detections were outside of the acceptance criteria for 4-amino-2.6-dinotrotoluene (47.9%) and 2-amino-4,6-dintrotoluene (53.3%) associated with sample JP-L3-GWMW630-0412, 4-amino-2.6-dinotrotoluene (61.7%) and 2-amino-4,6-dintrotoluene (58.1%) associated with sample JP-L3-GWMW999-0412, and 1,3,5-trinitrobenzene (51.3%) associated with sample JP-L3-GWMW412-0412 for SDG 500-45420-1.

The %D between the duel columns for samples with detections were outside of the acceptance criteria for 1.3-dinitrobenzene (130.0%) associated with sample JP-L1-GWMW131 and 4-amino-2.6-dinotrotoluene (63.5%) and 1,3,5-trinitrobenzene (189.8%) associated with sample JP-L1-GWWES1 for SDG 500-45457-1.

The %D between the duel columns for samples with detections was outside of the acceptance criteria for 2-nitrotoluene (79.0%) associated with sample JP-M13-GWMW362 for SDG 500-45518-1.

The %D between the duel columns for samples were outside of the acceptance criteria for RDX (182.3%) and 3-nitrotoluene (149.1%) associated with sample JP-M06-MWGW654 for SDG 500-45519-1.

The %D between the duel columns for samples were outside of the acceptance criteria for the following associated with SDG 500-45521-1:

- 2,4-dinitrotoluene (113.0%) associated with sample JP-M06-MWGW162R
- 4-amino-2.6-dinotrotoluene (61.5%) and 2-amino-4,6-dintrotoluene (60.2%) associated with sample JP-M06-MWGW212R
- 2,6-dinitrotoluene (146.1%) and 2,4-dinitrotoluene (176.1%) associated with sample JP-M06-MWGW318
- 2,4,6-trinitrotoluene (129.6%) associated with sample JP-M06-MWGW319
- 4-amino-2.6-dinotrotoluene (67.5%) associated with sample JP-M06-GWMW652
- 4-amino-2.6-dinotrotoluene (71.9%) and 4-nitrotoluene (57.2%) associated with sample JP-M06-GWMW994

All detections associated with these compounds and samples above were qualified with "J".

The surrogate spike %R recoveries were all acceptable with the exception of 1,2-dinitrobenzene (201%). All detected compounds associated with the following compounds were qualified as "J":

- JP-M06-GWMW318

TAL Metals – The MSD (JP-M13-GWMW126R) %R for magnesium (70%), sodium (76%), and mercury (77%) were less than the acceptable limits. These metals were qualified "J" as estimated for detections and UJ for non-detects in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

Sulfate - Sulfate accuracy QA/QC were acceptable.

Nitrate – Nitrate accuracy QA/QC were acceptable.

Accuracy was also quantitatively evaluated by reviewing concentrations of the following QA/QC samples:

- ICBs
- CCBs
- Method blanks
- Trip blanks

3.2.3 February 2012

VOCs – VOCs were not detected in associated blanks.

SVOCs – SVOCs were not detected in associated blanks.

Explosives – Explosives were not detected in associated blanks.

TAL Metals – The following metals were detected in method blanks, ICBs, or CCBs:

- antimony (0.00357 milligrams per liter [mg/L])
- barium (0.000520 mg/L and 0.0664 mg/L)
- lead (0.00175 mg/L and 0.0032 mg/L)

Antimony was qualified "U" as not detected at the reported concentration in the following samples:

- JP-M13-GWMW362 (0.0035 U)
- JP-M13-GWMW807 (0.0030 U)

- JP-M13-GWMW809 (0.0028 U)
- JP-M13-GWMW999 (0.0031 U)
- JP-M13-GWMW808 (0.0033 U)

Lead was qualified "U" as not detected at the reported concentration in the following samples:

- JP-M13-GWMW362 (0.0016 U)
- JP-M13-GWMW126R (0.0016 U)
- JP-M13-GWMW999 (0.0016 U)
- JP-M13-GWMW807 (0.0017 U)

Qualifiers were not added to the data for barium because either the sample concentration was greater than five times the blank concentration or the analyte was not detected.

Sulfate – Sulfate was detected in the following blanks:

- ICB/CCB (0.0976 mg/L)

Sulfate was not qualified based on blank contamination because all sample concentrations were greater than five times the blank concentration or sulfate was not detected.

Nitrate – Nitrate was not detected in associated blanks.

3.2.4 April 2012

VOCs – VOCs were not detected in associated blanks.

SVOCs – SVOCs were not detected in associated blanks.

Explosives – Explosives were not detected in associated blanks.

TAL Metals – The following metals were detected in method blanks, ICBs, or CCBs:

- copper (0.00549 mg/L)

Copper was qualified "U" as not detected at the reported concentration in the following samples:

- JP-L3-GWMW412-0412 (0.026U)
- JP-L3-GWMW630-0412 (0.027U)
- JP-L3-GWMW631-0412 (0.015U)
- JP-L3-GWMW633-0412 (0.023U)
- JP-L3-GWMW999-0412 (0.020U)
- JP-L3-SW557-0412 (0.023U)

- JP-L3-SW558-0412 (0.0066U)
- JP-L3-SW777-0412 (0.0041U)

The following metals were detected in method blanks, ICBs, or CCBs:

- copper (0.00557 mg/L)
- calcium (0.100 mg/L)
- zinc (0.00582 mg/L)

Copper was qualified "U" as not detected at the reported concentration in the following samples:

- JP-L3-SW004-0412 (0.018U)

Sulfate – Sulfate was not detected in associated blanks.

Nitrate – Nitrate was not detected in associated blanks.

3.3 REPRESENTATIVENESS

Representativeness was evaluated through a review of the following QA/QC elements:

- Sample preservation
- Sample holding times
- Compliance with sample collection, handling, and analysis methods specified in the Work Plan

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to representativeness.

3.3.1 February 2012

VOCs – Representativeness was acceptable.

SVOCs – Representativeness was acceptable. However, sample JP-M13-GWMWAEHA-14R was reanalyzed (original analysis reported low surrogate recovery) outside of the acceptable hold time. Detections were qualified with "J" and non-detects were qualified with UJ as a result.

Explosives – Representativeness was acceptable.

TAL Metals – Representativeness was acceptable.

Sulfate – Representativeness was acceptable.

Nitrate – Representativeness was acceptable.

3.3.2 April 2012

VOCs – Representativeness was acceptable.

SVOCs – Representativeness was acceptable.

Explosives – Representativeness was acceptable.

TAL Metals – Representativeness was acceptable.

Nitrate – Representativeness was acceptable. However samples JP-M13-GWMW999, JP-M13-GWMW809, JP-M13-GWMW806, and JP-M13-GWMW807 were reanalyzed outside of the acceptable hold time. Detections were qualified with "J" and non-detects were qualified with UJ.

Sulfate – Representativeness was acceptable.

3.4 COMPARABILITY

Comparability was qualitatively evaluated through a review of the following QA/QC elements:

- Sample collection and handling procedures
- Sample preparation, analysis, and quantitation procedures
- Units of measure

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to comparability.

Comparability was acceptable for the February and April 2012 sampling events.

3.5 COMPLETENESS

Completeness was calculated by dividing the number of acceptable sample results by the total number of scheduled sample results. The completeness goal for holding times was 100%. Completeness goals for holding times were met for all analytes in the April 2012 sampling round. The completeness goal for holding times for February 2012 samples was 97.7% since the SVOC results were re-run for sample JP-M13-GWAEHA14R outside of hold times.

The laboratory completeness goal for the number of acceptable sample results compared to the total sample results is 95%. Only results qualified "R" as unusable were considered unacceptable sample results for calculating laboratory completeness. Sample results qualified "J" as estimated, "U" as not detected, or "UJ" as not detected estimated quantitation limit were considered quantitative and acceptable.

No analytes were qualified "R" as unusable for the February and April 2012 sampling rounds with the exception of naphthalene due to the low biased surrogate recoveries for sample JP-M13-GWMWAEHA-14R (sampled March 1, 2012 associated with the February 2012 samples). However, this sample was reanalyzed and the re-run analyses resulted in no rejected results. Completeness was 100% for February 2012 and 100% for April 2012. Data usability was 100% for the February and April 2012 sampling rounds.

Refer to QAPP Worksheet #37 for the data usability criteria.

3.6 SENSITIVITY

Sensitivity was evaluated by comparing method reporting limits (MRLs) with appropriate criteria. In samples not requiring dilutions, adequate sensitivity was demonstrated with MRLs equal to or less than the associated criteria.

Refer to QAPP Worksheet #15 the Reference Limits and Evaluation Table for compound specific MRLs, method detection limits, and project action limits.

3.7 TRACEABILITY

Traceability was evaluated by reviewing field documentation, chain-of-custody documentation, and analytical reports. Each sample was found to be traceable from collection through analysis.

3.8 DATA QUALIFIERS

Refer to Tables 3.1 through 3.5 for summaries of groundwater and surface water data. Refer to Appendix B2 for data validation reports.

3.9 CONCLUSIONS

As discussed in section 3.5, completeness goals were met for the February and April 2012 analytical data. The data complies with contract requirements. The estimated data qualified "J" or "UJ" and blank qualified data qualified "U" which does not meet QA criteria are considered usable and do not negatively impact the project objectives. There were no biases or trends observed in this dataset.

4.0 REFERENCES

DoD, 2006. *Quality Systems Manual for Environmental Laboratories, Final Version 3*, DoD Environmental Data Quality Workgroup. January 2006.

MWH, 2011. *Final Quality Assurance Project Plan (QAPP) JOAAP Environmental Remediation,* MWH America's Inc. (MWH), March 2011.

USEPA, 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods Third Edition*. November 1986.

USEPA, 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June 2008.

USEPA, 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. January 2010.

B2 - DATA VALIDATION REPORTS – LABORATORY DATA CONSULTANTS (LDC)

LDC Validation Report #27391

(February 2012 Samples)

Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437 **Web** www.lab-data.com **Fax** 760.634.0439

Toltest.
5201 Jewell Lane
Poducah KY 42001
ATTN: Mr. Gary Reside

April 11, 2012

SUBJECT: JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 29, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27391:

SDG #	Fraction
500-44539-1	Volatiles, Semivolatiles, Dissolved Metals, Wet Chemistry,
500-44555-1	Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager

Attachment 1

Level III EDD

LDC #27391 (Toltest-Poducah,KY / JOAAP-GW)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		SVOA (8270C)		Diss. Metals (SW846)		Expl. (8330)		Diss. NO_3-N (300.0)		Diss. SO_4 (300.0)																					
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	500-44539-1	03/29/12	04/19/12	8	0	7	0	7	0	7	0	7	0	7	0																		
B	500-44555-1	03/29/12	04/19/12	3	0	3	0	2	0	2	0	2	0	2	0																		
Total	T/CR			11	0	10	0	9	0	9	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW809
JP-M13-GWMW999
JP-M13-GWMW808
TRIP BLANK
JP-M13-GWMW808MS
JP-M13-GWMW808MSD

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/12/12	2-Butanone trans-1,3-Dichloropropene 2-Hexanone Hexachlorobutadiene 1,2,3-Trichlorobenzene	24.9 22.5 34.4 28.5 32.3	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	A

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/20/12	Dichlorodifluoromethane Chloromethane	27.6 21.7	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample "TRIP BLANK" was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	Vinyl acetate 2-Hexanone 1,1,2-Trichloroethane	123 (45-121) - 131 (75-125)	123 (45-121) 131 (55-130) 129 (75-125)	- - -	J (all detects) J (all detects) J (all detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
500-142990/5	1,1,2-Trichloroethane	129 (75-125)	All samples in SD 500-44539-1	J (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No volatiles were detected in any of the samples.

JOAAP-GW
Volatiles - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808 TRIP BLANK	2-Butanone trans-1,3-Dichloropropene 2-Hexanone Hexachlorobutadiene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808 TRIP BLANK	Dichlorodifluoromethane Chloromethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-44539-1	JP-M13-GWMW808	Vinyl acetate 2-Hexanone 1,1,2-Trichloroethane	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808 TRIP BLANK	1,1,2-Trichloroethane	J (all detects)	P	Laboratory control samples (%R)

JOAAP-GW
Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW
Volatiles - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0055			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0055				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 UJ		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 UJ		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 UJ		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 UJ		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 UJ		0.56	5.0
Hexachlorobutadiene	<1.0 UJ		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

03/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0055			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0055				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 U5		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	102		75 - 120
Dibromofluoromethane	109		85 - 115
1,2-Dichloroethane-d4 (Surr)	91		70 - 120
Toluene-d8 (Surr)	98		85 - 120

03/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-02.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0119			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0119				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0	U	1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0	U	0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U	0.56	5.0
Hexachlorobutadiene	<1.0	U	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-02.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0119			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0119				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	98		75 - 120
Dibromofluoromethane	103		85 - 115
1,2-Dichloroethane-d4 (Surr)	90		70 - 120
Toluene-d8 (Surr)	103		85 - 120

08/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-03.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0144			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0144				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0	U5	1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U5	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U5	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0	U5	0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U5	0.56	5.0
Hexachlorobutadiene	<1.0	U5	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

03/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-03.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0144			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0144				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	99		75 - 120
Dibromofluoromethane	103		85 - 115
1,2-Dichloroethane-d4 (Surr)	90		70 - 120
Toluene-d8 (Surr)	100		85 - 120

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0209			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0209				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 U5		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	2.4	J	0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 U5		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 U5		0.26	1.0
1,1-Dichloroethane	1.4		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	0.79	J	0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 U5		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 U5		0.56	5.0
Hexachlorobutadiene	<1.0 U5		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

04/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0209			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0209				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Dibromofluoromethane	104		85 - 115
1,2-Dichloroethane-d4 (Surr)	91		70 - 120
Toluene-d8 (Surr)	97		85 - 120

02/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-05.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0234			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0234				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 U5		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 U5		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 U5		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 U5		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 U5		0.56	5.0
Hexachlorobutadiene	<1.0 U5		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

C24/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-05.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0234			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0234				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 U5		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Dibromofluoromethane	107		85 - 115
1,2-Dichloroethane-d4 (Surr)	94		70 - 120
Toluene-d8 (Surr)	105		85 - 120

CRL 10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-06.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0259			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0259				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0	U5	1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U5	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U5	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0	U5	0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U5	0.56	5.0
Hexachlorobutadiene	<1.0	U5	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

CE 4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-06.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0259			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0259				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 U5		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane	105		85 - 115
1,2-Dichloroethane-d4 (Surr)	92		70 - 120
Toluene-d8 (Surr)	104		85 - 120

04/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-07.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0324			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0324				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0	U5	1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U5	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U5	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0	U5	0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U5	0.56	5.0
Hexachlorobutadiene	<1.0	U5	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

04/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-07.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0324			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0324				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Dibromofluoromethane	105		85 - 115
1,2-Dichloroethane-d4 (Surr)	93		70 - 120
Toluene-d8 (Surr)	95		85 - 120

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 500-44539-8TB
Client Matrix: Water

Date Sampled: 02/29/2012 0000
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0439			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0439				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0	U5	1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U5	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U5	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0	U5	0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U5	0.56	5.0
Hexachlorobutadiene	<1.0	U5	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 500-44539-8TB
Client Matrix: Water

Date Sampled: 02/29/2012 0000
Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-142990	Instrument ID:	CMS18
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	44539-08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	03/13/2012 0439			Final Weight/Volume:	5 mL
Prep Date:	03/13/2012 0439				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 CS		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Dibromofluoromethane	110		85 - 115
1,2-Dichloroethane-d4 (Surr)	91		70 - 120
Toluene-d8 (Surr)	105		85 - 120

04/10/12

LDC #: 27391A1
SDG #: 500-44539-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 4/4/12
Page: 1 of 1
Reviewer: BK
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 02/29/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 30/15? r^2
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 20%.
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	FD = 5 + 6
XVII.	Field blanks	ND	TB = 8

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Water

1	JP-M13-GWMW126R	11	500 - 142990-MB	21		31	
2	JP-M13-GWMW362	12		22		32	
3	JP-M13-GWMW806	13		23		33	
4	JP-M13-GWMW807	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW999	16		26		36	
7	JP-M13-GWMW808	17		27		37	
8	TRIP BLANK	18		28		38	
9	JP-M13-GWMW808MS	19		29		39	
10	JP-M13-GWMW808MSD	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 27391A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: BK
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	2/20/12	ICV-CMS18	JJ	27.6		All	J|UJ|A
			A	21.7			↓
	3/12/12	18C0312n	M	24.9		All	J|UJ|A
			W	22.5			
			Z	34.4			
			LLL	28.5			
			NNN	32.3			

LDC #: 27391A1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: BK
2nd Reviewer: L

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		9/10	HH	123 (45-121)	123 (45-121)	( )	7	J det LA
			Z	( )	131 (55-130)	( )		↓
			U	131 (75-125)	129 (75-125)	( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
S.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
V.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
CC.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
DD.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 27391A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: BR
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?
Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		500-142990/5	U	129 (75-125)	( )	( )	All	J det/A P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW809
JP-M13-GWMW999
JP-M13-GWMW808
JP-M13-GWMW808MS
JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/15/12	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	17.0 25.0 16.0 18.0 20.0 19.0	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	A

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/15/12	4-Chlorophenyl-phenyl ether	20.2	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	A
	2,4-Dimethylphenol	21.5			
	2-Methylnaphthalene	23.4			
	2,4,6-Trichlorophenol	22.2			
	2-Chloronaphthalene	20.6			
	Acenaphthene	20.5			
	2,4-Dinitrophenol	25.8			
	4-Nitrophenol	20.5			
	Fluorene	22.1			
	N-Nitrosodiphenylamine	23.8			
	4-Bromophenyl-phenyl ether	21.3			
	Hexachlorobenzene	24.0			
	Phenanthrene	21.9			
	Anthracene	21.7			
	Carbazole	20.5			
	Benzo(a)anthracene	21.8			

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	Benzo(a)pyrene	116 (55-110)	120 (55-110)	-	J (all detects)	A
	Di-n-octylphthalate	-	141 (35-135)	-	J (all detects)	

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No semivolatiles were detected in any of the samples.

JOAAP-GW
Semivolatiles - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-44539-1	JP-M13-GWMW808	Benzo(a)pyrene Di-n-octylphthalate	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW
Semivolatiles - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-1.d
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	03/16/2012 1722			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.95 U		0.34	0.95
N-Nitrosodimethylamine	<9.5		1.3	9.5
Acenaphthylene	<0.95		0.30	0.95
Anthracene	<0.95 U		0.30	0.95
Benzidine	<38		19	38
Benzoic acid	<19 U		4.3	19
Benzo[a]anthracene	<0.19 U		0.042	0.19
Benzo[b]fluoranthene	<0.19		0.055	0.19
Benzo[k]fluoranthene	<0.24 U		0.070	0.24
Benzo[g,h,i]perylene	<0.95		0.40	0.95
Benzo[a]pyrene	<0.19		0.053	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.29	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.29	1.9
Bis(2-ethylhexyl) phthalate	<9.5 U		2.3	9.5
4-Bromophenyl phenyl ether	<4.8 U		0.87	4.8
Butyl benzyl phthalate	<1.9 U		0.26	1.9
Carbazole	<4.8 U		0.94	4.8
4-Chloroaniline	<9.5		2.0	9.5
4-Chloro-3-methylphenol	<9.5		2.1	9.5
2-Chloronaphthalene	<1.9 U		0.32	1.9
2-Chlorophenol	<4.8		0.76	4.8
4-Chlorophenyl phenyl ether	<4.8 U		0.77	4.8
Chrysene	<0.48		0.13	0.48
Dibenz(a,h)anthracene	<0.29		0.061	0.29
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.8		0.76	4.8
1,2-Dichlorobenzene	<1.9		0.28	1.9
1,3-Dichlorobenzene	<1.9		0.24	1.9
1,4-Dichlorobenzene	<1.9		0.26	1.9
3,3'-Dichlorobenzidine	<4.8		0.90	4.8
2,4-Dichlorophenol	<9.5		2.2	9.5
Diethyl phthalate	<1.9		0.42	1.9
2,4-Dimethylphenol	<9.5 U		3.2	9.5
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.7	19
2,4-Dinitrophenol	<19 U		7.1	19
2,4-Dinitrotoluene	<1.3		0.29	1.3
2,6-Dinitrotoluene	<0.48		0.11	0.48
Di-n-octyl phthalate	<9.5		2.4	9.5
Fluoranthene	<0.95		0.30	0.95
Fluorene	<0.95 U		0.36	0.95
1,2-Diphenylhydrazine	<4.8		0.67	4.8
Hexachlorobenzene	<0.48 U		0.13	0.48
Hexachlorobutadiene	<4.8		1.1	4.8

CS 4/10/12 03/22/2012

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-1.d
Dilution:	1.0			Initial Weight/Volume:	1050 mL
Analysis Date:	03/16/2012 1722			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.8		0.92	4.8
Indeno[1,2,3-cd]pyrene	<0.24		0.080	0.24
Isophorone	<1.9		0.28	1.9
2-Methylnaphthalene	<0.48 U5		0.12	0.48
2-Methylphenol	<1.9		0.30	1.9
3 & 4 Methylphenol	<1.9 U5		0.42	1.9
Naphthalene	<0.95		0.29	0.95
2-Nitroaniline	<4.8		1.0	4.8
3-Nitroaniline	<9.5		2.2	9.5
4-Nitroaniline	<9.5		3.7	9.5
Nitrobenzene	<0.95		0.43	0.95
2-Nitrophenol	<9.5		2.0	9.5
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.95 U5		0.32	0.95
N-Nitrosodi-n-propylamine	<0.48		0.13	0.48
Pentachlorophenol	<9.5		5.3	9.5
Phenanthrene	<0.95 U5		0.33	0.95
Phenol	<4.8		0.34	4.8
Pyrene	<0.95		0.46	0.95
1,2,4-Trichlorobenzene	<1.9		0.29	1.9
2,4,5-Trichlorophenol	<9.5		2.2	9.5
2,4,6-Trichlorophenol	<4.8 U5		1.0	4.8

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	37		20 - 110
Phenol-d5	25		10 - 115
Nitrobenzene-d5	70		40 - 110
2-Fluorobiphenyl	70		50 - 110
2,4,6-Tribromophenol	79		40 - 125
Terphenyl-d14	92		50 - 135

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-2.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1742			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93 U		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 U		4.3	19
Benzo[a]anthracene	<0.19 U		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23 U		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3 U		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 U		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 U		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3 U		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U	^	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 U		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47 U		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-2.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1742			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U5		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93 U5		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U5		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U5		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	33		20 - 110
Phenol-d5	22		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	63		50 - 110
2,4,6-Tribromophenol	75		40 - 125
Terphenyl-d14	85		50 - 135

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-3.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1802			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	0.13	J	0.041	0.19
Benzo[b]fluoranthene	0.15	J	0.054	0.19
Benzo[k]fluoranthene	0.17	J	0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	0.16	J	0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	0.13	J	0.13	0.47
Dibenz(a,h)anthracene	0.18	J	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	^	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

03/22/2012

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-3.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1802			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	0.17	J	0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U		2.2	19
N-Nitrosodiphenylamine	<0.93 U		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	32		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	59		40 - 110
2-Fluorobiphenyl	59		50 - 110
2,4,6-Tribromophenol	75		40 - 125
Terphenyl-d14	86		50 - 135

CEA/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-4.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1822			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-4.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1822			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U5		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93 U5		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U5		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U5		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	34		20 - 110
Phenol-d5	23		10 - 115
Nitrobenzene-d5	64		40 - 110
2-Fluorobiphenyl	67		50 - 110
2,4,6-Tribromophenol	79		40 - 125
Terphenyl-d14	87		50 - 135

04/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-5.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1842			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93 U		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 U		4.3	19
Benzo[a]anthracene	<0.19 U		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23 U		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3 U		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 U		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 U		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3 U		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 U		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47 U		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

04/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-5.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 1842			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U5		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93 U5		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U5		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U5		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	31		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	64		40 - 125
Terphenyl-d14	90		50 - 135

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-6.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 2002			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93 U		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 U		4.3	19
Benzo[a]anthracene	<0.19 U		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23 U		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3 U		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 U		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 U		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3 U		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 U		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47 U		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-6.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 2002			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U5		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93 U5		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U5		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U5		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	34		20 - 110
Phenol-d5	23		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	69		40 - 125
Terphenyl-d14	90		50 - 135

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-7.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 2022			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U5		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93 U5		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 U5		4.3	19
Benzo[a]anthracene	<0.19 U5		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23 U5		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3 U5		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 U5		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 U5		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3 U5		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U5		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 U5		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47 U5		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44539-7.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/16/2012 2022			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 U5		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93 U5		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93 U5		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7 U5		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	41		20 - 110
Phenol-d5	29		10 - 115
Nitrobenzene-d5	74		40 - 110
2-Fluorobiphenyl	82		50 - 110
2,4,6-Tribromophenol	93		40 - 125
Terphenyl-d14	80		50 - 135

LDC #: 27391A2 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/4/12
SDG #: 500-44539-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: BR
2nd Reviewer: W

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 02/29/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD ≤ 30/15 2, r^2
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 20 2
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	FD = 576
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Water

1	JP-M13-GWMW126R	11	500-142158-MB	21		31	
2	JP-M13-GWMW362	12		22		32	
3	JP-M13-GWMW806	13		23		33	
4	JP-M13-GWMW807	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW999	16		26		36	
7	JP-M13-GWMW808	17		27		37	
8	JP-M13-GWMW808MS	18		28		38	
9	JP-M13-GWMW808MSD	19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. ~~4-Methylphenol~~ 3 & 4 Methyl-phenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 27391B2

SDG #:

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: BR
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Y N N/A Did the initial calibration meet the acceptance criteria?

Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30/15% %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%/15%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	03/15/12	ICAL-CMS23	I	17.0		All	J/UJ/A
			PPP	25.0			
			NN	16.0			
			AAA	18.0			
			EEE	20.0			
			HHH	19.0			

LDC #: 27391A2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BK
2nd Reviewer: [signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤~~25~~ 20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤~~25.0~~ 20%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	3/15/12	ICV-CMS23	M	20.2		All	J/UJ/A
			O	21.5			
			W	23.4			
			Y	22.2			
			AA	20.6			
			GG	20.5			
			HH	25.8			
			II	20.5			
			NN	22.1			
			QQ	23.8			
			RR	21.3			
			SS	24.0			
			UU	21.9			
			VV	21.7			
			WW	20.5			
			CCC	21.8			

LDC #: 27391A2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8/9	III	114 (55-110)	120 (55-110)	( )	7	J+ 1A
			FFF	( )	141 (35-135)	( )		J
				( )	( )	( )		
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW809
JP-M13-GWMW999
JP-M13-GWMW808
JP-M13-GWMW808MS
JP-M13-GWMW808MSD
JP-M13-GWMW808DUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Antimony Barium Lead	0.00357 mg/L 0.000520 mg/L 0.00175 mg/L	All samples in SDG 500-44539-1

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-M13-GWMW126R	Lead	0.0016 mg/L	0.0016U mg/L
JP-M13-GWMW362	Antimony Lead	0.0035 mg/L 0.0016 mg/L	0.0035U mg/L 0.0016U mg/L
JP-M13-GWMW807	Antimony Lead	0.0030 mg/L 0.0017 mg/L	0.0030U mg/L 0.0017U mg/L
JP-M13-GWMW809	Antimony	0.0028 mg/L	0.0028U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-M13-GWMW999	Antimony Lead	0.0031 mg/L 0.0016 mg/L	0.0031U mg/L 0.0016U mg/L
JP-M13-GWMW808	Antimony	0.0033 mg/L	0.0033U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
JP-M13-GWMW808	Potassium	12 (≤10)	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No dissolved metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW809	JP-M13-GWMW999				
Antimony	0.0028	0.0031	-	0.0003 (≤0.040)	-	-
Barium	0.031	0.031	-	0 (≤0.020)	-	-
Calcium	41	40	2 (≤25)	-	-	-
Lead	0.0050U	0.0016	-	0.0034 (≤0.0100)	-	-
Magnesium	31	31	0 (≤25)	-	-	-
Manganese	0.0055	0.0059	7 (≤25)	-	-	-
Potassium	2.6	2.6	0 (≤25)	-	-	-
Sodium	19	19	0 (≤25)	-	-	-
Vanadium	0.0022	0.0024	-	0.0002 (≤0.0100)	-	-

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	Potassium	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D)

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-44539-1	JP-M13-GWMW126R	Lead	0.0016U mg/L	A
500-44539-1	JP-M13-GWMW362	Antimony Lead	0.0035U mg/L 0.0016U mg/L	A
500-44539-1	JP-M13-GWMW807	Antimony Lead	0.0030U mg/L 0.0017U mg/L	A
500-44539-1	JP-M13-GWMW809	Antimony	0.0028U mg/L	A
500-44539-1	JP-M13-GWMW999	Antimony Lead	0.0031U mg/L 0.0016U mg/L	A
500-44539-1	JP-M13-GWMW808	Antimony	0.0033U mg/L	A

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1134			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.055	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	67		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0016 U	J B	0.0016	0.0050
Magnesium	43		0.024	0.10
Manganese	0.0088	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.4 J		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	26		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0029	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0847			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

02/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1156			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0035	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.044	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	160		0.087	0.20
Chromium	0.0010	J	0.00096	0.010
Cobalt	0.0011	J	0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0016	J B	0.0016	0.0050
Magnesium	100		0.024	0.10
Manganese	0.043		0.0011	0.010
Nickel	0.0044	J	0.0019	0.010
Potassium	8.5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0047	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-142619	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50307B
Dilution:	10			Initial Weight/Volume:	50 mL
Analysis Date:	03/07/2012 2039			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	180		1.2	10

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0849			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1202			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.096	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	76		0.087	0.20
Chromium	0.00096	J	0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	46		0.024	0.10
Manganese	0.0017	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.1 J		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	24		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0031	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0850			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

03/22/2012

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1209			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.026	J	0.025	0.20
Antimony	0.0030 U	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.097	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.82		0.070	0.20
Lead	0.0017 U	J B	0.0016	0.0050
Magnesium	89		0.024	0.10
Manganese	0.092		0.0011	0.010
Nickel	0.0021	J	0.0019	0.010
Potassium	14 J		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-142619	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50307B
Dilution:	100			Initial Weight/Volume:	50 mL
Analysis Date:	03/07/2012 2045			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	400		12	100

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0852			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

03/24/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1215			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0028 U	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.031	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	41		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	31		0.024	0.10
Manganese	0.0055	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.6 J		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0022	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0854			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

CE 4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1221			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0031 U	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.031	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	40		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0016 U	J B	0.0016	0.0050
Magnesium	31		0.024	0.10
Manganese	0.0059	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.6 J		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0024	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0855			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

CS 4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142211	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50302A
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/02/2012 1227			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0033 U	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.16	B	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	120		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0082		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	1.7		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	67		0.024	0.10
Manganese	0.55		0.0011	0.010
Nickel	0.022		0.0019	0.010
Potassium	11 J	V	0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	J	0.00062	0.0050
Zinc	0.0066	J	0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-142619	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142106	Lab File ID:	P50307B
Dilution:	10			Initial Weight/Volume:	50 mL
Analysis Date:	03/07/2012 2051			Final Weight/Volume:	50 mL
Prep Date:	03/01/2012 1530				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	61		1.2	10

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0857			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

03/22/2012

LDC #: 27391A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-5-12

SDG #: 500-44539-1 Level III Page: 1 of 1

Laboratory: Test America, Inc. 9M Reviewer: MG

2nd Reviewer: ✓

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-29-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/MSD
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	D= 5+6
XV	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all water

1	JP-M13-GWMW126R	11		21		31	
2	JP-M13-GWMW362	12		22		32	
3	JP-M13-GWMW806	13		23		33	
4	JP-M13-GWMW807	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW999	16		26		36	
7	JP-M13-GWMW808	17		27		37	
8	JP-M13-GWMW808MS	18		28		38	
9	JP-M13-GWMW808MSD	19		29		39	
10	JP-M13-GWMW808DUP	20	PBW	30		40	

Notes: _____

LDC #: 27391A4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1 → 7	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-,
QC 8 → 10	↓	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

		Analysis Method
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: [✓ Mercury by CVAA if performed]

LDC #: 27391A4

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: MG
2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: mg/L
Associated Samples: all

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (mg/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1	2	4	5	6	7				
Sb		0.00357		0.01785		0.0035	0.0030	0.0028	0.0031	0.0033				
Ba		0.000520		0.00260										
Pb		0.00175		0.00875	0.0016	0.0016	0.0017		0.0016					

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 27391A4

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1		7	water	K	12 (≤10)	all	J/UJ/A

Comments:

SDILICPMS.wpd

LDC#: 27391A4

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/6020/7000)

(Y) N NA Were field duplicate pairs identified in this SDG?
(Y) N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L) 5	Concentration (mg/L) 6	(≤25) RPD	(mg/L) Difference	(mg/L) Limits	Qualifications (Parent Only)
Antimony	0.0028	0.0031		0.0003	(≤0.040)	
Barium	0.031	0.031		0	(≤0.020)	
Calcium	41	40	2			
Lead	0.0050U	0.0016		0.0034	(≤0.0100)	
Magnesium	31	31	0			
Manganese	0.0055	0.0059	7			
Potassium	2.6	2.6	0			
Sodium	19	19	0			
Vanadium	0.0022	0.0024		0.0002	(≤0.0100)	

V:\FIELD DUPLICATES\FD_inorganic\27391A4.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW809
JP-M13-GWMW999
JP-M13-GWMW808
JP-M13-GWMW808MS
JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Nitrate as Nitrogen and Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Sulfate	0.0976 mg/L	JP-M13-GWMW362 JP-M13-GWMW807

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW809	JP-M13-GWMW999				
Sulfate	5.9	5.9	0 (≤25)	-	-	-

JOAAP-GW
Wet Chemistry - Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW
Wet Chemistry - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

General Chemistry

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.12		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1215						
Sulfate-Dissolved	53		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1230						

CR 4/10/12

General Chemistry

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0		mg/L	0.23	1.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1359						
Sulfate-Dissolved	280		mg/L	4.5	10	50	300.0
Analysis Batch: 500-143315	Analysis Date: 03/15/2012 0226						

General Chemistry

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.39		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1414						
Sulfate-Dissolved	79		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1429						

General Chemistry

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0		mg/L	0.23	1.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1459						
Sulfate-Dissolved	230		mg/L	4.5	10	50	300.0
Analysis Batch: 500-143315	Analysis Date: 03/15/2012 0241						

02/10/12

General Chemistry

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<0.10		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1514						
Sulfate-Dissolved	5.9		mg/L	0.090	0.20	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1514						

02/10/12

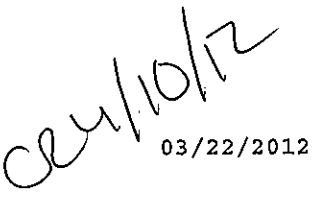
General Chemistry

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<0.10		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1543						
Sulfate-Dissolved	5.9		mg/L	0.090	0.20	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1543						



General Chemistry

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<0.10		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1643						
Sulfate-Dissolved	99		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1657						

LDC #: 27391A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-5-12
SDG #: 500-44539-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: ✓

METHOD: Dissolved Nitrate-N, Dissolved Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-29-12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	D= 5+6
XI.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all water

1	JP-M13-GWMW126R	11		21		31	
2	JP-M13-GWMW362	12		22		32	
3	JP-M13-GWMW806	13		23		33	
4	JP-M13-GWMW807	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW999	16		26		36	
7	JP-M13-GWMW808	17		27		37	
8	JP-M13-GWMW808MS	18		28		38	
9	JP-M13-GWMW808MSD	19	PBW1	29		39	
10		20	PBW2	30		40	

Notes:

LDC #: 27391A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→7	W	pH TDS Cl F [✓ NO_3] NO_2 [✓ SO_4] PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
QC 8.9	↓	pH TDS Cl F [✓ NO_3] NO_2 [✓ SO_4] PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ___ ___
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

LDC #: 27391A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: [signature]

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: mg/L **Associated Samples: 2,4 (50x dil, >5x)**

Analyte	Blank ID	Blank ID	Blank Action Limit									
[redacted]	PB	ICB/CCB (mg/L)		No Qual's.								
SO4		0.0976	24.40									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC#: 27391A6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MG
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD (≤25)	Difference	Limits	Qualification (Parent only)
	5	6				
Sulfate	5.9	5.9	0			

V:\FIELD DUPLICATES\FD_inorganic\27391A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW809
JP-M13-GWMW999
JP-M13-GWMW808
JP-M13-GWMW808MS
JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	HMX 1,3,5-Trinitrobenzene 4-Nitrotoluene	133 (80-115) 142 (65-140) 137 (50-130)	134 (80-115) - 137 (50-130)	- - -	J (all detects) J (all detects) J (all detects)	A

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No explosives were detected in any of the samples.

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW808	HMX 1,3,5-Trinitrobenzene 4-Nitrotoluene	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-44539-1
Client Matrix: Water

Date Sampled: 02/29/2012 1000
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 1746			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	113		70 - 130

CRA 10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-44539-2
Client Matrix: Water

Date Sampled: 02/29/2012 1120
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 1837			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	1.5		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.83		0.035	0.31
4-Amino-2,6-dinitrotoluene	0.78		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	109		70 - 130

CE 4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-44539-3
Client Matrix: Water

Date Sampled: 02/29/2012 1300
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 1929			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	111		70 - 130

03/22/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW807

Lab Sample ID: 500-44539-4
Client Matrix: Water

Date Sampled: 02/29/2012 1350
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2020			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	109		70 - 130

CE 4/10/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: 500-44539-5
Client Matrix: Water

Date Sampled: 02/29/2012 1700
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2112			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	109		70 - 130

3/22/12

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-44539-6
Client Matrix: Water

Date Sampled: 02/29/2012 1200
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2203			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	111		70 - 130

03/22/2012

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-44539-7
Client Matrix: Water

Date Sampled: 02/29/2012 1510
Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2255			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	101		70 - 130

04/10/12

LDC #: 27391A40 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/03/12
SDG #: 500-44539-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: AA
2nd Reviewer: JVG

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 02/29/12
II	Initial calibration	A	%RSD ≤ 20%.
III.	Calibration verification/ICV	A	%D ≤ 15%.
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	A ~~SW~~ AA 4/04/12	LCS ONLY
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	ND	FD=5,6
XIII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: WATER

1	JP-M13-GWMW126R	11	142545 MB	21		31	
2	JP-M13-GWMW362	12		22		32	
3	JP-M13-GWMW806	13		23		33	
4	JP-M13-GWMW807	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW999	16		26		36	
7	JP-M13-GWMW808	17		27		37	
8	JP-M13-GWMW808MS	18		28		38	
9	JP-M13-GWMW808MSD	19		29		39	
10		20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P. 1,2-DINITROBENZENE		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_____

LDC #: 27391A40

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: KA
2nd Reviewer: JVG

METHOD: __ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	8/9	A	133 (80-115)	134 (80-115)	( )	7	✓ J/A J dets
	↓	C	142 (65-140)	( )	( )	↓	↓
	↓	N	137 (50-130)	137 (50-130)	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15
JP-M13-GWMWAEHA 14R
Trip Blank

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/14/12	Dichlorodifluoromethane	25.8	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	A
	Vinyl acetate	20.3			
	cis-1,3-Dichloropropene	27.3			
	4-Methyl-2-pentanone	26.8			
	1,1,1-Trichloroethane	32.9			
	1,1,2-Trichloroethane	22.5			
	2-Hexanone	29.6			
	1,2-Dibromoethane	24.6			
	1,1,2,2-Tetrachloroethane	21.9			
	n-Propylbenzene	23.5			
	Hexachlorobutadiene	30.6			
	1,2,3-Trichlorobenzene	32.5			

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/20/12	Dichlorodifluoromethane Chloromethane	27.6 21.7	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample "Trip Blank" was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
500-143093/4	Vinyl acetate	125 (45-121)	All samples in SD 500-44555-1	J (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Volatiles - Data Qualification Summary - SDG 500-44555-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Dichlorodifluoromethane Vinyl acetate cis-1,3-Dichloropropene 4-Methyl-2-pentanone 1,1,1-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,2-Dibromoethane 1,1,2,2-Tetrachloroethane n-Propylbenzene Hexachlorobutadiene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Dichlorodifluoromethane Chloromethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Vinyl acetate	J (all detects)	P	Laboratory control samples (%R)

JOAAP-GW
Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Volatiles - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: **JP-M13-GWMWAEHA 15**

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0802
Prep Date: 03/14/2012 0802

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-01.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	UJ	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	UJ *	0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0	UJ	0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	UJ	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0	UJ	0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	UJ	0.56	5.0
Hexachlorobutadiene	<1.0	UJ	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0	UJ	0.79	5.0

02/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0802
Prep Date: 03/14/2012 0802

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-01.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0	U	0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0	U	0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0	U	0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0	U	0.26	1.0
1,1,2-Trichloroethane	<1.0	U	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	94		75 - 120
Dibromofluoromethane	102		85 - 115
1,2-Dichloroethane-d4 (Surr)	85		70 - 120
Toluene-d8 (Surr)	97		85 - 120

03/16/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0827
Prep Date: 03/14/2012 0827

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-02.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 UJ		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0 UJ	*	0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0 UJ		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 UJ		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0 UJ		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 UJ		0.56	5.0
Hexachlorobutadiene	<1.0 UJ		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0 UJ		0.79	5.0

CS 4/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: **JP-M13-GWMWAEHA 14R**

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0827
Prep Date: 03/14/2012 0827

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-02.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0	UJ	0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0	UJ	0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0	UJ	0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0	UJ	0.26	1.0
1,1,2-Trichloroethane	<1.0	UJ	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	101		75 - 120
Dibromofluoromethane	112		85 - 115
1,2-Dichloroethane-d4 (Surr)	96		70 - 120
Toluene-d8 (Surr)	98		85 - 120

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: **Trip Blank**

Lab Sample ID: 500-44555-3TB
Client Matrix: Water

Date Sampled: 03/01/2012 0000
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0852
Prep Date: 03/14/2012 0852

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-03.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0	U5	0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	U5 *	0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0	U5	0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0	U5	0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0	U5	0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0	U5	0.56	5.0
Hexachlorobutadiene	<1.0	U5	0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0	U5	0.79	5.0

CR 4/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: Trip Blank

Lab Sample ID: 500-44555-3TB
Client Matrix: Water

Date Sampled: 03/01/2012 0000
Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 03/14/2012 0852
Prep Date: 03/14/2012 0852

Analysis Batch: 500-143093
Prep Batch: N/A

Instrument ID: CMS18
Lab File ID: 44555-03.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0 U5		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0 U5		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 U5		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0 U5		0.26	1.0
1,1,2-Trichloroethane	<1.0 U5		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane	108		85 - 115
1,2-Dichloroethane-d4 (Surr)	88		70 - 120
Toluene-d8 (Surr)	103		85 - 120

02/6/12

LDC #: 27391B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/5/12
SDG #: 500-44555-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: BR
2nd Reviewer: V

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 03/01/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD ≤ 30 / 152 r^2
IV.	Continuing calibration/ICV	SW	ICV / CCV ≤ 20?
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client spec.
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Water

1	JP-M13-GWMWAEHA 15	11	500-143093-MB	21		31	
2	JP-M13-GWMWAEHA 14R	12		22		32	
3	Trip Blank	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 27391B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BA
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25 %)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	02/20/12	ICV-CMS18	JJ	27.6		All	J/UJ/A
			A	21.7			↓
	03/14/12	18C0313n	JJ	25.8		All	J/UJ/A
			HH	20.3			
			R	27.3			
			Y	26.8			
			N	32.9			
			U	22.5			
			Z	29.6			
			TT	24.6			
			BB	21.9			
			YY	23.5			
			LLL	30.6			
			NNN	32.5			↓

LDC #: 27391B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: BA
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?
Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		500-143093/4	HH	125 (45-121)	( )	( )	All	J det/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15
JP-M13-GWMWAEHA 14R
JP-M13-GWMWAEHA 14RRE

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
JP-M13-GWMWAEHA 14RRE	All TCL compounds	18	7	J (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/15/12	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	17.0 25.0 16.0 18.0 20.0 19.0	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	A

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/20/12	Bis(2-chloroethyl) ether	25.5	JP-M13-GWMWAEHA 14RRE 500-143645-MB	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/15/12	4-Chlorophenyl-phenyl ether	20.2	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	A
	2,4-Dimethylphenol	21.5			
	2-Methylnaphthalene	23.4			
	2,4,6-Trichlorophenol	22.2			
	2-Chloronaphthalene	20.6			
	Acenaphthene	20.5			
	2,4-Dinitrophenol	25.8			
	4-Nitrophenol	20.5			
	Fluorene	22.1			
	N-Nitrosodiphenylamine	23.8			
	4-Bromophenyl-phenyl ether	21.3			
	Hexachlorobenzene	24.0			
	Phenanthrene	21.9			
	Anthracene	21.7			
	Carbazole	20.5			
	Benzo(a)anthracene	21.8			

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JP-M13-GWMWAEHA 14R	2-Fluorophenol Phenol-d5 Nitrobenzene-d5 2-Fluorobiphenyl	3 (20-110) 7 (10-115) 5 (40-110) 38 (50-110)	All TCL compounds	J (all detects) R (all non-detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
500-143645/2-A (JP-M13-GWMWAEHA 14R 500-143645-MB)	Benzidine Benzoic acid 2-Nitroaniline 4-Nitrophenol	- - - -	- - - -	27 (≤20) 116 (≤20) 25 (≤20) 27 (≤20)	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
JP-M13-GWMWAEHA 14R	Chrysene-d12 Perylene-d12	276691 (284090-1136358) 218084 (342810-685619)`	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Benzidine Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Semivolatiles - Data Qualification Summary - SDG 500-44555-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44555-1	JP-M13-GWMWAEHA 14RRE	All TCL compounds	J (all detects) UJ (all non-detects)	A	Technical holding time
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R JP-M13-GWMWAEHA 14RRE	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
500-44555-1	JP-M13-GWMWAEHA 14RRE	Bis(2-chloroethyl) ether	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R JP-M13-GWMWAEHA 14RRE	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-44555-1	JP-M13-GWMWAEHA 14R	All TCL compounds	J (all detects) R (all non-detects)	A	Surrogate spikes (%R)
500-44555-1	JP-M13-GWMWAEHA 14R	Benzidine Benzoic acid 2-Nitroaniline 4-Nitrophenol	J (all detects) UJ (all non-detects)	P	Laboratory control samples (RPD)
500-44555-1	JP-M13-GWMWAEHA 14R	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Benzidine Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area)

JOAAP-GW
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Semivolatiles - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 03/16/2012 2042
Prep Date: 03/02/2012 0915

Analysis Batch: 500-143421
Prep Batch: 500-142158

Instrument ID: CMS23
Lab File ID: 44555-1.d
Initial Weight/Volume: 950 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<1.1 UJ		0.38	1.1
N-Nitrosodimethylamine	<11 UJ		1.4	11
Acenaphthylene	<1.1		0.34	1.1
Anthracene	<1.1 UJ		0.34	1.1
Benzidine	<42		21	42
Benzoic acid	<21 UJ		4.8	21
Benzo[a]anthracene	<0.21 UJ		0.046	0.21
Benzo[b]fluoranthene	<0.21		0.061	0.21
Benzo[k]fluoranthene	<0.26 UJ		0.078	0.26
Benzo[g,h,i]perylene	<1.1		0.44	1.1
Benzo[a]pyrene	<0.21		0.059	0.21
Benzyl alcohol	<21		3.2	21
Bis(2-chloroethoxy)methane	<2.1		0.32	2.1
Bis(2-chloroethyl)ether	<2.1		0.37	2.1
2,2'-oxybis[1-chloropropane]	<2.1		0.32	2.1
Bis(2-ethylhexyl) phthalate	<11 UJ		2.6	11
4-Bromophenyl phenyl ether	<5.3 UJ		0.96	5.3
Butyl benzyl phthalate	<2.1 UJ		0.28	2.1
Carbazole	<5.3 UJ		1.0	5.3
4-Chloroaniline	<11		2.2	11
4-Chloro-3-methylphenol	<11		2.3	11
2-Chloronaphthalene	<2.1 UJ		0.36	2.1
2-Chlorophenol	<5.3		0.84	5.3
4-Chlorophenyl phenyl ether	<5.3 UJ		0.85	5.3
Chrysene	<0.53		0.15	0.53
Dibenz(a,h)anthracene	<0.32		0.067	0.32
Dibenzofuran	<2.1		0.37	2.1
Di-n-butyl phthalate	<5.3		0.84	5.3
1,2-Dichlorobenzene	<2.1		0.31	2.1
1,3-Dichlorobenzene	<2.1		0.26	2.1
1,4-Dichlorobenzene	<2.1		0.28	2.1
3,3'-Dichlorobenzidine	<5.3		0.99	5.3
2,4-Dichlorophenol	<11		2.4	11
Diethyl phthalate	<2.1		0.46	2.1
2,4-Dimethylphenol	<11 UJ		3.5	11
Dimethyl phthalate	<2.1		0.40	2.1
4,6-Dinitro-2-methylphenol	<21		5.2	21
2,4-Dinitrophenol	<21 UJ	^	7.8	21
2,4-Dinitrotoluene	<1.5		0.32	1.5
2,6-Dinitrotoluene	<0.53		0.13	0.53
Di-n-octyl phthalate	<11		2.6	11
Fluoranthene	<1.1		0.34	1.1
Fluorene	<1.1 UJ		0.40	1.1
1,2-Diphenylhydrazine	<5.3		0.74	5.3
Hexachlorobenzene	<0.53 UJ		0.15	0.53
Hexachlorobutadiene	<5.3		1.2	5.3

02/16/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143421	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-142158	Lab File ID:	44555-1.d
Dilution:	1.0			Initial Weight/Volume:	950 mL
Analysis Date:	03/16/2012 2042			Final Weight/Volume:	1.0 mL
Prep Date:	03/02/2012 0915			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<5.3		1.0	5.3
Indeno[1,2,3-cd]pyrene	<0.26		0.088	0.26
Isophorone	<2.1		0.31	2.1
2-Methylnaphthalene	<0.53 UJ		0.14	0.53
2-Methylphenol	<2.1 UJ 03/24/12		0.33	2.1
3 & 4 Methylphenol	<2.1 UJ		0.46	2.1
Naphthalene	<1.1		0.32	1.1
2-Nitroaniline	<5.3		1.1	5.3
3-Nitroaniline	<11		2.4	11
4-Nitroaniline	<11		4.1	11
Nitrobenzene	<1.1		0.47	1.1
2-Nitrophenol	<11		2.3	11
4-Nitrophenol	<21 UJ		2.5	21
N-Nitrosodiphenylamine	<1.1		0.36	1.1
N-Nitrosodi-n-propylamine	<0.53		0.15	0.53
Pentachlorophenol	<11		5.9	11
Phenanthrene	<1.1 UJ		0.37	1.1
Phenol	<5.3		0.38	5.3
Pyrene	<1.1		0.51	1.1
1,2,4-Trichlorobenzene	<2.1		0.32	2.1
2,4,5-Trichlorophenol	<11		2.4	11
2,4,6-Trichlorophenol	<5.3 UJ		1.2	5.3

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	41		20 - 110
Phenol-d5	28		10 - 115
Nitrobenzene-d5	73		40 - 110
2-Fluorobiphenyl	79		50 - 110
2,4,6-Tribromophenol	74		40 - 125
Terphenyl-d14	85		50 - 135

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 03/16/2012 2102
Prep Date: 03/02/2012 0915

Analysis Batch: 500-143421
Prep Batch: 500-142158

Instrument ID: CMS23
Lab File ID: 44555-2.d
Initial Weight/Volume: 1050 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.95	R	0.34	0.95
N-Nitrosodimethylamine	<9.5		1.3	9.5
Acenaphthylene	<0.95		0.30	0.95
Anthracene	<0.95		0.30	0.95
Benzidine	<38		19	38
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.042	0.19
Benzo[b]fluoranthene	<0.19		0.055	0.19
Benzo[k]fluoranthene	<0.24		0.070	0.24
Benzo[g,h,i]perylene	<0.95		0.40	0.95
Benzo[a]pyrene	<0.19		0.053	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.29	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.29	1.9
Bis(2-ethylhexyl) phthalate	<9.5		2.3	9.5
4-Bromophenyl phenyl ether	<4.8		0.87	4.8
Butyl benzyl phthalate	<1.9		0.26	1.9
Carbazole	<4.8		0.94	4.8
4-Chloroaniline	<9.5		2.0	9.5
4-Chloro-3-methylphenol	<9.5		2.1	9.5
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.8		0.76	4.8
4-Chlorophenyl phenyl ether	<4.8		0.77	4.8
Chrysene	<0.48		0.13	0.48
Dibenz(a,h)anthracene	<0.29		0.061	0.29
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.8		0.76	4.8
1,2-Dichlorobenzene	<1.9		0.28	1.9
1,3-Dichlorobenzene	<1.9		0.24	1.9
1,4-Dichlorobenzene	<1.9		0.26	1.9
3,3'-Dichlorobenzidine	<4.8		0.90	4.8
2,4-Dichlorophenol	<9.5		2.2	9.5
Diethyl phthalate	<1.9		0.42	1.9
2,4-Dimethylphenol	<9.5		3.2	9.5
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.7	19
2,4-Dinitrophenol	<19	^	7.1	19
2,4-Dinitrotoluene	<1.3		0.29	1.3
2,6-Dinitrotoluene	<0.48		0.11	0.48
Di-n-octyl phthalate	<9.5		2.4	9.5
Fluoranthene	<0.95		0.30	0.95
Fluorene	<0.95		0.36	0.95
1,2-Diphenylhydrazine	<4.8		0.67	4.8
Hexachlorobenzene	<0.48		0.13	0.48
Hexachlorobutadiene	<4.8		1.1	4.8

03/16/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 03/16/2012 2102
Prep Date: 03/02/2012 0915

Analysis Batch: 500-143421
Prep Batch: 500-142158

Instrument ID: CMS23
Lab File ID: 44555-2.d
Initial Weight/Volume: 1050 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.8 R		0.92	4.8
Indeno[1,2,3-cd]pyrene	<0.24		0.080	0.24
Isophorone	<1.9		0.28	1.9
2-Methylnaphthalene	<0.48		0.12	0.48
2-Methylphenol	<1.9		0.30	1.9
3 & 4 Methylphenol	<1.9		0.42	1.9
Naphthalene	0.32 J	J	0.29	0.95
2-Nitroaniline	<4.8 R		1.0	4.8
3-Nitroaniline	<9.5		2.2	9.5
4-Nitroaniline	<9.5		3.7	9.5
Nitrobenzene	<0.95		0.43	0.95
2-Nitrophenol	<9.5		2.0	9.5
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.95		0.32	0.95
N-Nitrosodi-n-propylamine	<0.48		0.13	0.48
Pentachlorophenol	<9.5		5.3	9.5
Phenanthrene	<0.95		0.33	0.95
Phenol	<4.8		0.34	4.8
Pyrene	<0.95		0.46	0.95
1,2,4-Trichlorobenzene	<1.9		0.29	1.9
2,4,5-Trichlorophenol	<9.5		2.2	9.5
2,4,6-Trichlorophenol	<4.8		1.0	4.8

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	3	X	20 - 110
Phenol-d5	7	X	10 - 115
Nitrobenzene-d5	5	X	40 - 110
2-Fluorobiphenyl	38	X	50 - 110
2,4,6-Tribromophenol	83		40 - 125
Terphenyl-d14	111		50 - 135

CR 4/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143761	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-143645	Lab File ID:	44555-2RE.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/20/2012 1739	Run Type:	RE	Final Weight/Volume:	1.0 mL
Prep Date:	03/19/2012 1330			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U 5	H	0.34	0.93
N-Nitrosodimethylamine	<9.3	H	1.3	9.3
Acenaphthylene	<0.93	H	0.30	0.93
Anthracene	<0.93	H	0.30	0.93
Benzidine	<37	H *	19	37
Benzoic acid	<19	H *	4.3	19
Benzo[a]anthracene	<0.19	H	0.041	0.19
Benzo[b]fluoranthene	<0.19	H	0.054	0.19
Benzo[k]fluoranthene	<0.23	H	0.069	0.23
Benzo[g,h,i]perylene	<0.93	H	0.39	0.93
Benzo[a]pyrene	<0.19	H	0.052	0.19
Benzyl alcohol	<19	H	2.9	19
Bis(2-chloroethoxy)methane	<1.9	H	0.28	1.9
Bis(2-chloroethyl)ether	<1.9	H	0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	H	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3	H	2.3	9.3
4-Bromophenyl phenyl ether	<4.7	H	0.85	4.7
Butyl benzyl phthalate	<1.9	H	0.25	1.9
Carbazole	<4.7	H	0.93	4.7
4-Chloroaniline	<9.3	H	2.0	9.3
4-Chloro-3-methylphenol	<9.3	H	2.1	9.3
2-Chloronaphthalene	<1.9	H	0.32	1.9
2-Chlorophenol	<4.7	H	0.75	4.7
4-Chlorophenyl phenyl ether	<4.7	H	0.76	4.7
Chrysene	<0.47	H	0.13	0.47
Dibenz(a,h)anthracene	<0.28	H	0.060	0.28
Dibenzofuran	<1.9	H	0.33	1.9
Di-n-butyl phthalate	<4.7	H	0.75	4.7
1,2-Dichlorobenzene	<1.9	H	0.27	1.9
1,3-Dichlorobenzene	<1.9	H	0.23	1.9
1,4-Dichlorobenzene	<1.9	H	0.25	1.9
3,3'-Dichlorobenzidine	<4.7	H	0.88	4.7
2,4-Dichlorophenol	<9.3	H	2.1	9.3
Diethyl phthalate	<1.9	H	0.41	1.9
2,4-Dimethylphenol	<9.3	H	3.1	9.3
Dimethyl phthalate	<1.9	H	0.36	1.9
4,6-Dinitro-2-methylphenol	<19	H	4.6	19
2,4-Dinitrophenol	<19	H ^	6.9	19
2,4-Dinitrotoluene	<1.3	H	0.28	1.3
2,6-Dinitrotoluene	<0.47	H	0.11	0.47
Di-n-octyl phthalate	<9.3	H	2.3	9.3
Fluoranthene	<0.93	H	0.30	0.93
Fluorene	<0.93	H	0.36	0.93
1,2-Diphenylhydrazine	<4.7	H	0.65	4.7
Hexachlorobenzene	<0.47	H	0.13	0.47
Hexachlorobutadiene	<4.7	H	1.0	4.7

03/26/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-143761	Instrument ID:	CMS23
Prep Method:	3510C	Prep Batch:	500-143645	Lab File ID:	44555-2RE.d
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	03/20/2012 1739	Run Type:	RE	Final Weight/Volume:	1.0 mL
Prep Date:	03/19/2012 1330			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7 U5	H	0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23	H	0.079	0.23
Isophorone	<1.9	H	0.27	1.9
2-Methylnaphthalene	<0.47	H	0.12	0.47
2-Methylphenol	<1.9	H	0.29	1.9
3 & 4 Methylphenol	<1.9	H	0.41	1.9
Naphthalene	<0.93	H	0.28	0.93
2-Nitroaniline	<4.7	H *	1.0	4.7
3-Nitroaniline	<9.3	H	2.1	9.3
4-Nitroaniline	<9.3	H	3.7	9.3
Nitrobenzene	<0.93	H	0.42	0.93
2-Nitrophenol	<9.3	H	2.0	9.3
4-Nitrophenol	<19	H *	2.2	19
N-Nitrosodiphenylamine	<0.93	H	0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	H	0.13	0.47
Pentachlorophenol	<9.3	H	5.2	9.3
Phenanthrene	<0.93	H	0.33	0.93
Phenol	<4.7	H	0.34	4.7
Pyrene	<0.93	H	0.45	0.93
1,2,4-Trichlorobenzene	<1.9	H	0.28	1.9
2,4,5-Trichlorophenol	<9.3	H	2.1	9.3
2,4,6-Trichlorophenol	<4.7	H	1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	33		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	67		40 - 125
Terphenyl-d14	86		50 - 135

04/6/12

LDC #: 27391B2 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/5/12
SDG #: 500-44555-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: BK
2nd Reviewer: ✓

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 03/01/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD ≤ 30/15?, r2
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 20?
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	Client spec.
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Water

1 1	JP-M13-GWMWAEHA 15	11 1	500-142158-MS	21		31	
2 1	JP-M13-GWMWAEHA 14R	12 2	500-143645-MS	22		32	
3 2	JP-M13-GWMWAEHA 14RRE	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	MM. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	NN. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	OOO. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	PPP. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 3+4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

CRY = O

PRY = X

LDC #: 27391B2

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: BR
2nd Reviewer:

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2	W	N	03/01/12	03/14/12	03/20/12	18	J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 27391B2

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: BK
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

(Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

(Y) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____

(Y) N N/A Did the initial calibration meet the acceptance criteria?

Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 (15) %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: <30.0%) (15)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	03/15/12	ICV-CMS23 ICAL	I	17.0		All + 500-142358-MB	J (all J/A)
			PPP	25.0		+ 500-143645-MB	
			NN	16.0			
			AAA	18.0			
			EEE	20.0			
			HHH	19.0			

INICAL.2S

LDC #: 27391B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: BK
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ~~≤25~~ 20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ~~≤25~~ 20 %)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	03/15/12	ICV - CMS23	M	20.2		All + 500 - 142258-MB +	J/UJ/A
			O	21.5		500 - 143645-MB	
			W	23.4			
			Y	22.2			
			AA	20.6			
			GG	20.5			
			HH	25.8			
			II	20.5			
			NN	22.1			
			QQ	23.8			
			RR	21.3			
			SS	24.0			
			UU	21.9			
			VV	21.7			
			WW	20.5			
			CCC	21.8			
	03/20/12	23C0320	B	25.5		3 + 500 - 143645-MB	J/UJ/A

CONCAL.2S

LDC #: 27361B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Q N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
(Y) N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		2	2FP	3 (~~20~~ 20-110)	J/R/A (ALL TCLs)
			PHL	7 (10-115)	↓
			NBZ	5 (40-110)	
			FBP	38 (50-110)	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 27391B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: BR
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		500-143645/2-A	SSS	( )	( )	27 (20)	All sr 2+	J/UJ/P
			PPP	( )	( )	116 (20)	500-143645-MB	
			BB	( )	( )	25 (20)	— — —	—
			II	( )	( )	27 (20)		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 27391B2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: BR
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		2	CRY	276691 (284090 - 1136358)		J/UJ/A (See
			PRY	218084 (342810 - 685619)		↓ list)

* QC limits are advisory

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15
JP-M13-GWMWAEHA 14R
JP-M13-GWMWAEHA 14RMS
JP-M13-GWMWAEHA 14RMSD
JP-M13-GWMWAEHA 14RDUP

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-142619	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-142171	Lab File ID:	P50307B
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	03/07/2012 1941			Final Weight/Volume:	50 mL
Prep Date:	03/02/2012 0800				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	5.7		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	0.0076	J	0.0024	0.010
Barium	0.10		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	140		0.087	0.20
Chromium	0.0088	J	0.00096	0.010
Cobalt	0.0066		0.0010	0.0050
Copper	0.013		0.0011	0.010
Iron	15		0.070	0.20
Lead	0.012		0.0016	0.0050
Magnesium	77		0.024	0.10
Manganese	0.54		0.0011	0.010
Nickel	0.013		0.0019	0.010
Potassium	4.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	20		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.014		0.00062	0.0050
Zinc	0.029		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-142537	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-142429	Lab File ID:	030712R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	03/07/2012 0908			Final Weight/Volume:	25 mL
Prep Date:	03/06/2012 1415				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

04/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 03/07/2012 1947
Prep Date: 03/02/2012 0800

Analysis Batch: 500-142619
Prep Batch: 500-142171

Instrument ID: ICP5
Lab File ID: P50307B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.027	J	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.089		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	110		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0012	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	50		0.024	0.10
Manganese	0.0019	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	12		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0029	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 5.0
Analysis Date: 03/09/2012 0344
Prep Date: 03/02/2012 0800

Analysis Batch: 500-142761
Prep Batch: 500-142171

Instrument ID: ICP5
Lab File ID: P50308C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	50		0.60	5.0

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 03/07/2012 0910
Prep Date: 03/06/2012 1415

Analysis Batch: 500-142537
Prep Batch: 500-142429

Instrument ID: HG6
Lab File ID: 030712R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

02/16/12

LDC #: 27391B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-5-12

SDG #: 500-44555-1 Level III Page: 1 of 1

Laboratory: Test America, Inc. Reviewer: MG

2nd Reviewer:

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 3-1-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/MSD
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all water

1	JP-M13-GWMWAEHA 15	11		21		31	
2	JP-M13-GWMWAEHA 14R	12		22		32	
3	JP-M13-GWMWAEHA 14RMS	13		23		33	
4	JP-M13-GWMWAEHA 14RMSD	14		24		34	
5	JP-M13-GWMWAEHA 14RDUP	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20	PBW	30		40	

Notes:

LDC #: 27391B4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1, 2	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN$^-$, ___
QC 3→5	↓	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$,
Analysis Method		
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN$^-$,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN$^-$

Comments: [✓ Mercury by CVAA if performed]

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15
JP-M13-GWMWAEHA 14R

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Nitrate as Nitrogen and Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VI. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Wet Chemistry - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Wet Chemistry - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

General Chemistry

Client Sample ID: **JP-M13-GWMWAEHA 15**

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.13		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1812						
Sulfate-Dissolved	12		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1826						

03/16/12

General Chemistry

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	1.7		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1841						
Sulfate-Dissolved	140		mg/L	1.8	4.0	20	300.0
Analysis Batch: 500-143904	Analysis Date: 03/20/2012 2005						

03/24/12

LDC #: 27391B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-5-12
SDG #: 500-44555-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: [signature]

METHOD: Dissolved Nitrate-N, Dissolved Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 3-1-12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	client specified
VI.	Duplicates	N	" "
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
all water

1	JP-M13-GWMWAEHA 15	11		21		31	
2	JP-M13-GWMWAEHA 14R	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19	PBW 1	29		39	
10		20	PBW 2	30		40	

Notes:

LDC #: 27391B6

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1, 2	W	pH TDS Cl F [✓ NO_3] NO_2 [✓ SO_4] PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 _____ _____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

METHODS.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15
JP-M13-GWMWAEHA 14R

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: **JP-M13-GWMWAEHA 15**

Lab Sample ID: 500-44555-1
Client Matrix: Water

Date Sampled: 03/01/2012 0900
Date Received: 03/01/2012 1505

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/08/2012 0221			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	103		70 - 130

02/6/12

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID: **JP-M13-GWMWAEHA 14R**

Lab Sample ID: 500-44555-2
Client Matrix: Water

Date Sampled: 03/01/2012 1200
Date Received: 03/01/2012 1505

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-142553	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	03/08/2012 0313			Injection Volume:	100 uL
Prep Date:	03/07/2012 0840			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.79		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.1		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	107		70 - 130

03/24/12

LDC #: 27391B40 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/03/12
SDG #: 500-44555-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: ~~AA~~
2nd Reviewer: JV6

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 3/01/12
II	Initial calibration	A	%RSD ≤ 20%.
III.	Calibration verification/ICV	A	%D ≤ 15%.
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	A ~~A SW~~ AA analyte	LCS ONLY
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: WATER

1	JP-M13-GWMWAEHA 15	11	142545MB	21		31	
2	JP-M13-GWMWAEHA 14R	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC Validation Report #27595

(April 2012 Samples)

Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437 **Web** www.lab-data.com **Fax** 760.634.0439

Toltest.
5201 Jewell Lane
Poducah KY 42001
ATTN: Mr. Gary Reside

May 23, 2012

SUBJECT: JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed is the final validation report for the fractions listed below. This SDG was received on May 7, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27595:

SDG #	Fraction
500-45420-1	Dissolved Metals, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

Attachment 1

Level III EDD

LDC #27595 (Toltest-Poducah,KY / JOAAP-GW)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Diss. Metals (SW846)		Expl. (8330)																													
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	500-45420-1	05/07/12	05/29/12	8	0	12	0																												
Total	A/CR			8	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 10 through April 11, 2012

LDC Report Date: May 16, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45420-1

Sample Identification

JP-L3-SW557-0412
JP-L3-SW558-0412
JP-L3-GWMW631-0412
JP-L3-GWMW630-0412
JP-L3-GWMW999-0412
JP-L3-GWMW412-0412
JP-L3-GWMW633-0412
JP-L3-SW777-0412

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Copper	0.00549 mg/L	All samples in SDG 500-45420-1

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-SW557-0412	Copper	0.023 mg/L	0.023U mg/L
JP-L3-SW558-0412	Copper	0.0066 mg/L	0.0066U mg/L
JP-L3-GWMW631-0412	Copper	0.015 mg/L	0.015U mg/L
JP-L3-GWMW630-0412	Copper	0.027 mg/L	0.027U mg/L
JP-L3-GWMW999-0412	Copper	0.020 mg/L	0.020U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-GWMW412-0412	Copper	0.026 mg/L	0.026U mg/L
JP-L3-GWMW633-0412	Copper	0.023 mg/L	0.023U mg/L
JP-L3-SW777-0412	Copper	0.0041 mg/L	0.0041U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-L3-GWMW630-0412 and JP-L3-GWMW999-0412 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-L3-GWMW630-0412	JP-L3-GWMW999-0412				
Barium	0.011	0.011	-	0 (≤0.020)	-	-
Cadmium	0.00078	0.00087	-	0.00009 (≤0.040)	-	-
Calcium	83	84	1 (≤25)	-	-	-
Copper	0.027	0.020	-	0.007 (≤0.020)	-	-
Magnesium	43	44	2 (≤25)	-	-	-
Manganese	0.033	0.032	-	0.001 (≤0.020)	-	-
Potassium	4.4	4.4	0 (≤25)	-	-	-
Sodium	22	22	0 (≤25)	-	-	-
Zinc	0.0087	0.020U	-	0.0113 (≤0.040)	-	-

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45420-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-45420-1	JP-L3-SW557-0412	Copper	0.023U mg/L	A
500-45420-1	JP-L3-SW558-0412	Copper	0.0066U mg/L	A
500-45420-1	JP-L3-GWMW631-0412	Copper	0.015U mg/L	A
500-45420-1	JP-L3-GWMW630-0412	Copper	0.027U mg/L	A
500-45420-1	JP-L3-GWMW999-0412	Copper	0.020U mg/L	A
500-45420-1	JP-L3-GWMW412-0412	Copper	0.026U mg/L	A
500-45420-1	JP-L3-GWMW633-0412	Copper	0.023U mg/L	A
500-45420-1	JP-L3-SW777-0412	Copper	0.0041U mg/L	A

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-SW557-0412
Lab Sample ID: 500-45420-1
Lab Name: TestAmerica Chicago
Job No.: 500-45420-1
SDG ID.:
Matrix: Water
Date Sampled: 04/10/2012 16:40
Reporting Basis: WET
Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00085	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	75	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.023 U	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	39	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.072	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	15	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

05/21/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-SW558-0412 | Lab Sample ID: 500-45420-2

Lab Name: TestAmerica Chicago | Job No.: 500-45420-1

SDG ID.:

Matrix: Water | Date Sampled: 04/10/2012 16:20

Reporting Basis: WET | Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.042	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00079	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	80	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.0066	0.010	0.0011	mg/L	J	B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	43	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.0027	0.010	0.0011	mg/L	J		1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	6.2	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CRS 5/21/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-GWMW631-0412
Lab Sample ID: 500-45420-3
Lab Name: TestAmerica Chicago
Job No.: 500-45420-1
SDG ID.:
Matrix: Water
Date Sampled: 04/11/2012 09:40
Reporting Basis: WET
Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.017	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00082	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	67	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.015 U	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	36	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.022	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.9	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	28	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

05/21/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-GWMW630-0412 Lab Sample ID: 500-45420-4

Lab Name: TestAmerica Chicago Job No.: 500-45420-1

SDG ID.:

Matrix: Water Date Sampled: 04/11/2012 10:15

Reporting Basis: WET Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.011	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00078	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	83	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.027	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	43	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.033	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	22	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	0.0087	0.020	0.0047	mg/L	J		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CES 12/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-GWMW999-0412
Lab Sample ID: 500-45420-5
Lab Name: TestAmerica Chicago
Job No.: 500-45420-1
SDG ID.:
Matrix: Water
Date Sampled: 04/11/2012 12:00
Reporting Basis: WET
Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.011	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00087	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	84	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.020	U 0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	44	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.032	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	22	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CRS 12/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-GWMW412-0412 | Lab Sample ID: 500-45420-7

Lab Name: TestAmerica Chicago | Job No.: 500-45420-1

SDG ID.:

Matrix: Water | Date Sampled: 04/11/2012 12:10

Reporting Basis: WET | Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.042	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.0011	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	96	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.026	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	51	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	<0.010	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	7.7	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CRS 5/21/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-GWMW633-0412 Lab Sample ID: 500-45420-8

Lab Name: TestAmerica Chicago Job No.: 500-45420-1

SDG ID.:

Matrix: Water Date Sampled: 04/11/2012 13:05

Reporting Basis: WET Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.047	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00079	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	83	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.023	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	37	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	<0.010	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	5.7	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CRS 5/21/12

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-SW777-0412 | Lab Sample ID: 500-45420-9

Lab Name: TestAmerica Chicago | Job No.: 500-45420-1

SDG ID.:

Matrix: Water | Date Sampled: 04/11/2012 13:25

Reporting Basis: WET | Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00087	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	73	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.0041	0.010	0.0011	mg/L	J	B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	39	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.060	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	14	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	0.0087	0.020	0.0047	mg/L	J		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

CRS 5/24/12

LDC #: 27595A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-11-12
SDG #: 500-45420-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. gmM. Reviewer: MG
2nd Reviewer:

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-10-12 through 4-11-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	N	client specified
VII.	Duplicate Sample Analysis	N	" "
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	N	not performed
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	D = 4+5
XV	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all Water

1	JP-L3-SW557-0412	11		21		31	
2	JP-L3-SW558-0412	12		22		32	
3	JP-L3-GWMW631-0412	13		23		33	
4	JP-L3-GWMW632-0412	14		24		34	
5	JP-L3-GWMW999-0412	15		25		35	
6	JP-L3-GWMW412-0412	16		26		36	
7	JP-L3-GWMW633-0412	17		27		37	
8	JP-L3-SW777-0412	18		28		38	
9		19		29		39	
10		20	PBW	30		40	

gmM

Notes:

LDC #: 27595A4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: V

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→8	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
Analysis Method		
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg, [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: [✓ Mercury by CVAA if performed]

LDC #: 27595A4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: NA
Associated Samples: all

Reviewer: MG
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (mg/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1	2	3	4	5	6	7	8		
Cu		0.00549		0.02745	0.023	0.0066	0.015	0.027	0.020	0.026	0.023	0.0041		

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 27595A4 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6010B/6020/7000)

(Y)N NA Were field duplicate pairs identified in this SDG?
(Y)N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L) 4	Concentration (mg/L) 5	(≤25) RPD	(mg/L) Difference	(mg/L) Limits	Qualifications (Parent Only)
Barium	0.011	0.011		0	(≤0.020)	
Cadmium	0.00078	0.00087		0.00009	(≤0.0040)	
Calcium	83	84	1			
Copper	0.027	0.020		0.007	(≤0.020)	
Magnesium	43	44	2			
Manganese	0.033	0.032		0.001	(≤0.020)	
Potassium	4.4	4.4	0			
Sodium	22	22	0			
Zinc	0.0087	0.020U		0.0113	(≤0.040)	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 10 through April 11, 2012

LDC Report Date: May 23, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45420-1

Sample Identification

JP-L3-SW557-0412
JP-L3-SW558-0412
JP-L3-GWMW631-0412
JP-L3-GWMW630-0412
JP-L3-GWMW999-0412
JP-L3-GWMW410-0412
JP-L3-GWMW412-0412
JP-L3-GWMW633-0412
JP-L3-SW777-0412
JP-L1-GWMW174-0412
JP-L1-GWMWWES3-0412
JP-L1-GWMW173-0412

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample 23173-SB-022W. Since the sample was diluted out, no data were qualified.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS/D500-146630/2-A (All samples in SDG 500-45420-1)	HMX	116 (80-115)	121 (80-115)	-	J (all detects)	P

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-L3-GWMW630-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	47.9 53.3	J (all detects) J (all detects)	A
JP-L3-GWMW999-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	61.7 58.1	J (all detects) J (all detects)	A
JP-L3-GWMW412-0412	1,3,5-Trinitrobenzene	51.3	J (all detects)	A

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-L3-GWMW630-0412 and JP-L3-GWMW999-0412 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-L3-GWMW630-0412	JP-L3-GWMW999-0412				
HMX	4.7	4.7	0 (≤25)	-	-	-
2-Amino-4,6-dinitrotoluene	0.077	0.072	-	0.005 (≤0.31)	-	-
4-Amino-2,6-dinitrotoluene	0.18	0.15	-	0.03 (≤0.31)	-	-
RDX	8.7	8.7	0 (≤25)	-	-	-

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-45420-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45420-1	JP-L3-SW557-0412 JP-L3-SW558-0412 JP-L3-GWMW631-0412 JP-L3-GWMW630-0412 JP-L3-GWMW999-0412 JP-L3-GWMW410-0412 JP-L3-GWMW412-0412 JP-L3-GWMW633-0412 JP-L3-SW777-0412 JP-L1-GWMW174-0412 JP-L1-GWMWWES3-0412 JP-L1-GWMW173-0412	HMX	J (all detects)	P	Laboratory control samples (%R)
500-45420-1	JP-L3-GWMW630-0412 JP-L3-GWMW999-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (column difference)
500-45420-1	JP-L3-GWMW412-0412	1,3,5-Trinitrobenzene	J (all detects)	A	Compound quantitation and RLs (column difference)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-SW557-0412**

Lab Sample ID: 500-45420-1
Client Matrix: Water

Date Sampled: 04/10/2012 1640
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0144			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	1.1 J		0.12	0.31
RDX	3.2	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	112		70 - 130

CRS 4/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-SW558-0412**

Lab Sample ID: 500-45420-2
Client Matrix: Water

Date Sampled: 04/10/2012 1620
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0218			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	120		70 - 130

CS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW631-0412**

Lab Sample ID: 500-45420-3
Client Matrix: Water

Date Sampled: 04/11/2012 0940
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0253			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	114		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW630-0412**

Lab Sample ID: 500-45420-4
Client Matrix: Water

Date Sampled: 04/11/2012 1015
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0327			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	4.7		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.077	J	0.035	0.31
4-Amino-2,6-dinitrotoluene	0.18	J	0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	115		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW630-0412**

Lab Sample ID: 500-45420-4
Client Matrix: Water

Date Sampled: 04/11/2012 1015
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2103	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	8.7	*	0.77	1.6

QRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW999-0412**

Lab Sample ID: 500-45420-5
Client Matrix: Water

Date Sampled: 04/11/2012 1200
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0401			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	4.7 J		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.072 J	J	0.035	0.31
4-Amino-2,6-dinitrotoluene	0.15 J	J	0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	117		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW999-0412**

Lab Sample ID: 500-45420-5
Client Matrix: Water

Date Sampled: 04/11/2012 1200
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2137	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	8.7	*	0.77	1.6

QRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW410-0412**

Lab Sample ID: 500-45420-6
Client Matrix: Water

Date Sampled: 04/11/2012 1110
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0435			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	114		70 - 130

05/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW412-0412**

Lab Sample ID: 500-45420-7
Client Matrix: Water

Date Sampled: 04/11/2012 1210
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330
Prep Method: 3535
Dilution: 1.0
Analysis Date: 04/18/2012 0509
Prep Date: 04/17/2012 0940

Analysis Batch: 500-146545
Prep Batch: 500-146630

Instrument ID: INST35-36
Initial Weight/Volume: 770 mL
Final Weight/Volume: 6.0 mL
Injection Volume: 100 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,3,5-Trinitrobenzene	0.11 J	J	0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	0.24		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.89		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.7		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	116		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: JP-L3-GWMW412-0412

Lab Sample ID: 500-45420-7
Client Matrix: Water

Date Sampled: 04/11/2012 1210
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2211	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	28 J		1.2	3.1

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW412-0412**

Lab Sample ID: 500-45420-7
Client Matrix: Water

Date Sampled: 04/11/2012 1210
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2245	Run Type:	DL2	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	120	*	7.7	16

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW633-0412**

Lab Sample ID: 500-45420-8
Client Matrix: Water

Date Sampled: 04/11/2012 1305
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0617			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	2.0 J		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	114		70 - 130

crs 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-GWMW633-0412**

Lab Sample ID: 500-45420-8
Client Matrix: Water

Date Sampled: 04/11/2012 1305
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2319	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	6.7	*	0.77	1.6

05/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L3-SW777-0412**

Lab Sample ID: 500-45420-9
Client Matrix: Water

Date Sampled: 04/11/2012 1325
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0651			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	0.25	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	129		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L1-GWMW174-0412**

Lab Sample ID: 500-45420-10
Client Matrix: Water

Date Sampled: 04/11/2012 1305
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0725			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	114		70 - 130

QRS/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L1-GWMWWES3-0412**

Lab Sample ID: 500-45420-11
Client Matrix: Water

Date Sampled: 04/11/2012 1600
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0759			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	0.74	*	0.077	0.16
1,3,5-Trinitrobenzene	0.20		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	1.2		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.67		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.0		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	117		70 - 130

CRS 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L1-GWMW173-0412**

Lab Sample ID: 500-45420-12
Client Matrix: Water

Date Sampled: 04/11/2012 1400
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0833			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	1.4 J		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	4.8		0.035	0.31
4-Amino-2,6-dinitrotoluene	5.4		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	115		70 - 130

CR 5/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID: **JP-L1-GWMW173-0412**

Lab Sample ID: 500-45420-12
Client Matrix: Water

Date Sampled: 04/11/2012 1400
Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/19/2012 2353	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	10	*	0.77	1.6
2,4,6-Trinitrotoluene	12		0.36	1.6

QR 5/23/12

LDC #: 27595A40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/15/12
SDG #: 500-45420-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: AA
2nd Reviewer: CV

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/10-4/11/12
II	Initial calibration	A	%RSD ≤ 20%
III.	Calibration verification/ICV	~~A~~ SW	%D ≤ 15%, ICV/CCV
IV.	Blanks	A	
V	Surrogate recovery	SW	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	SW	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	~~SW~~ N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	SW	FD=4,5
XIII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: WATER

1	JP-L3-SW557-0412	11	JP-L3-GWMWWES3-0412	21	1466630MB	31	
2	JP-L3-SW558-0412	12	JP-L3-GWMW173-0412	22		32	
3	JP-L3-GWMW631-0412	13	~~B-DL~~	23		33	
4	JP-L3-GWMW632-0412	14		24		34	
5	JP-L3-GWMW999-0412	15		25		35	
6	JP-L3-GWMW410-0412	16		26		36	
7	JP-L3-GWMW412-0412	17		27		37	
8	JP-L3-GWMW633-0412	18		28		38	
9	JP-L3-SW777-0412	19		29		39	
10	JP-L3-GWMW174-0412	20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes: _____

_____

_____

LDC #: 27595 A40

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: MA
2nd Reviewer: [signature]

METHOD: __ GC _/ HPLC
Are surrogates required by the method? Yes / or No___.
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	7 (100X)	NS	Z	0 (54-148)	NO QUAL
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	(Z)	1,2-DINITROBENZENE
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 27595A40

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: m
2nd Reviewer: Q

METHOD: ___ GC ___ ~~HPLC~~

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level ~~IV/D~~ Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	~~146630LCS/D~~	A	116 (80-115)	121 (80-115)	( )	ALL + BLK	J/P dets.
LCS/	~~04041235-054/-055~~		( )	( )	( )		
D	500-146630/2-A		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 27595A40
SDG #: _____

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: MA
2nd Reviewer: [signature]

METHOD: ___ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	H	4	~~48~~ 47.9	J/A dlt.
	I	↓	53.3	
	H	5	~~62~~ 61.7	
	I	↓	58.1	
	C	7	51.3	↓

Comments: _____

LDC#: 27595A40
~~SDG#:~~

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: AA
2nd Reviewer: [illegible]

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L) 4	Concentration (ug/L) 5	(≤25) RPD	(ug/L) Difference	Qualifications (Parent Only)
A	4.7	4.7	0		No Qual.
I	~~0.77~~ 0.077	~~0.72~~ 0.072		0.005 ~~0.05~~ (limit ≤0.31)	
H	0.18	0.15		0.03 (limit ≤0.31)	
B	8.7	8.7	0		

Analyte	Concentration (ug/L)		(≤25) RPD	(ug/L) Difference	Qualifications (Parent Only)

LDC Validation Report #27605

(April 2012 Samples)

Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437 **Web** www.lab-data.com **Fax** 760.634.0439

Toltest.
5201 Jewell Lane
Poducah KY 42001
ATTN: Mr. Gary Reside

May 24, 2012

SUBJECT: JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed is the final validation report for the fractions listed below. This SDG was received on May 9, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27605:

SDG #	Fraction
500-45457-1	Dissolved Metals, Dissolved Sulfate, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

Attachment 1

Level III EDD	LDC #27605 (Toltest-Poducah,KY / JOAAP-GW)																																			
LDC	SDG#	DATE REC'D	(3) DATE DUE	Diss. Metals (SW846)		Expl. (8330)		Diss. SO_4 (300.0)																												
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	500-45457-1	05/09/12	05/30/12	1	0	7	0	14	0																											
Total	T/CR			1	0	7	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 10, 2012

LDC Report Date: May 14, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-L3-SW004-0412
JP-L3-SW004-0412MS
JP-L3-SW004-0412MSD
JP-L3-SW004-0412DUP

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Copper Zinc	0.100 mg/L 0.00556 mg/L 0.00582 mg/L	All samples in SDG 500-45457-1

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-SW004-0412	Copper	0.018 mg/L	0.018U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-45457-1	JP-L3-SW004-0412	Copper	0.018U mg/L	A

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS - DISSOLVED

Client Sample ID: JP-L3-SW004-0412
Lab Sample ID: 500-45457-1
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/10/2012 15:45
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00090	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	73	0.20	0.087	mg/L		B	1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.018	0.010	0.0011	mg/L		B	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	38	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.090	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	15	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

5/21/12

LDC #: 27605A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-11-12

SDG #: 500-45457-1 Level III Page: 1 of 1

Laboratory: Test America, Inc. mfg. Reviewer: MG

2nd Reviewer: V

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-10-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/MSD
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: water

1	JP-L3-SW004-0412	11		21		31	
2	JP-L3-SW004-0412MS	12		22		32	
3	JP-L3-SW004-0412MSD	13		23		33	
4	JP-L3-SW004-0412DUP	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20	PBW	30		40	

Notes: _____

LDC #: 27605A4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: ✓

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___
QC 2→4	↓	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg, [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
Analysis Method		
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg, [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-

Comments: [✓ Mercury by CVAA if performed]

LDC #: 27605A4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: NA
Associated Samples: all

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (mg/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1									
Ca		0.100		0.5000										
Cu		0.00556		0.0278	0.018									
Zn		0.00582		0.0291										

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 12 through April 13, 2012

LDC Report Date: May 16, 2012

Matrix: Water

Parameters: Dissolved Sulfate

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-M1-GWMW648-0412
JP-M1-GWMW998-0412
JP-M1-GWMW641-0412
JP-M1-GWMW997-0412
JP-M1-GWMW642-0412
JP-M1-GWMW640-0412
JP-M1-GWMW107-0412
JP-M1-GWMW231-0412
JP-M1-GWMW645-0412
JP-M1-GWMW646
JP-M1-GWMW649
JP-M1-GWMW644
JP-M1-GWMW643
JP-M1-SW709
JP-M1-GWMW641-0412MS
JP-M1-GWMW641-0412MSD

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M1-GWMW998-0412 and JP-M1-GWMW641-0412 and samples JP-M1-GWMW997-0412 and JP-M1-GWMW642-0412 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M1-GWMW998-0412	JP-M1-GWMW641-0412				
Sulfate	640	640	0 (≤25)	-	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M1-GWMW997-0412	JP-M1-GWMW642-0412				
Sulfate	420	420	0 (≤25)	-	-	-

JOAAP-GW
Dissolved Sulfate - Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW648-0412
Lab Sample ID: 500-45457-3
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 11:40
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	34	1.0	0.45	mg/L			5	300.0

QR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW998-0412
Lab Sample ID: 500-45457-4
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 12:00
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	640	20	9.0	mg/L			100	300.0

05/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW641-0412
Lab Sample ID: 500-45457-5
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 12:25
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	640	20	9.0	mg/L			100	300.0

CR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW997-0412
Lab Sample ID: 500-45457-6
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 12:45
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	420	10	4.5	mg/L			50	300.0

CRS 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW642-0412
Lab Sample ID: 500-45457-7
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 12:58
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	420	10	4.5	mg/L			50	300.0

QRS 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW640-0412
Lab Sample ID: 500-45457-8
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 13:40
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	5200	200	90	mg/L			1000	300.0

CR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW107-0412
Lab Sample ID: 500-45457-9
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 14:25
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	26000	1000	450	mg/L			5000	300.0

QR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW231-0412
Lab Sample ID: 500-45457-10
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/12/2012 15:20
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	35000	1000	450	mg/L			5000	300.0

QR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW645-0412
Lab Sample ID: 500-45457-11
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/13/2012 10:10
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	67	4.0	1.8	mg/L			20	300.0

CR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW646
Lab Sample ID: 500-45457-12
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/13/2012 10:50
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	110	10	4.5	mg/L			50	300.0

CR 5/24/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW649
Lab Sample ID: 500-45457-13
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/13/2012 11:40
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	64	4.0	1.8	mg/L			20	300.0

QR 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW644
Lab Sample ID: 500-45457-14
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/13/2012 10:04
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	160	10	4.5	mg/L			50	300.0

CR 5/24/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-GWMW643
Lab Sample ID: 500-45457-15
Lab Name: TestAmerica Chicago
Job No.: 500-45457-1
SDG ID.:
Matrix: Water
Date Sampled: 04/13/2012 09:32
Reporting Basis: WET
Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	58	4.0	1.8	mg/L			20	300.0

CRS 5/21/12

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY - DISSOLVED

Client Sample ID: JP-M1-SW709 | Lab Sample ID: 500-45457-19

Lab Name: TestAmerica Chicago | Job No.: 500-45457-1

SDG ID.:

Matrix: Water | Date Sampled: 04/13/2012 10:10

Reporting Basis: WET | Date Received: 04/14/2012 07:00

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
14808-79-8	Sulfate	60	4.0	1.8	mg/L			20	300.0

05/21/12

LDC #: 27605A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-11-12
SDG #: 500-45457-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: Dissolved Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-12-12 through 4-13-12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(2,3),(4,5)
XI	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
all water

1	JP-M1-GWMW648-0412	11	JP-M1-GWMW649	21		31	
2	JP-M1-GWMW998-0412	12	JP-M1-GWMW644	22		32	
3	JP-M1-GWMW641-0412	13	JP-M1-GWMW643	23		33	
4	JP-M1-GWMW997-0412	14	JP-M1-SW709	24		34	
5	JP-M1-GWMW642-0412	15	JP-M1-GWMW641-0412MS	25		35	
6	JP-M1-GWMW640-0412	16	JP-M1-GWMW641-0412MSD	26		36	
7	JP-M1-GWMW107-0412	17		27		37	
8	JP-M1-GWMW231-0412	18		28		38	
9	JP-M1-GWMW645-0412	19		29	PBW1	39	
10	JP-M1-GWMW646	20		30	PBW2	40	

Notes:

LDC#: 27605A6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer: MG
2nd Reviewer: AR

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD (≤25)	Difference	Limits	Qualification (Parent only)
	2	3				
Sulfate	640	640	0			

V:\FIELD DUPLICATES\FD_inorganic\27605A6.wpd

Analyte	Concentration (mg/L)		RPD (≤25)	Difference	Limits	Qualification (Parent only)
	4	5				
Sulfate	420	420	0			

V:\FIELD DUPLICATES\FD_inorganic\27605A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 12 through April 13, 2012

LDC Report Date: May 22, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-L3-SW004-0412
JP-L1-GWMW131
JP-L1-GWWES1
JP-L1-SW550
JP-OA-GWMW118
JP-OA-GWMW119
JP-OA-GWMW117

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/18/12	UC5 ODS	2-Nitrotoluene	17.5	JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample JP-L1-GWMW131. Since the sample was diluted out, no data were qualified.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LSC/D500-146630/2-A (All samples in SDG 500-45457-1)	HMX	116 (80-115)	121 (80-115)	-	J (all detects)	P

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-L1-GWMW131	1,3-Dinitrobenzene	130.0	J (all detects)	A
JP-L1-GWWES1	1,3,5-Trinitrobenzene 4-Amino-2,6-dinitrotoluene	189.8 63.5	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-45457-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45457-1	JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	2-Nitrotoluene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-45457-1	JP-L3-SW004-0412 JP-L1-GWMW131 JP-L1-GWWES1 JP-L1-SW550 JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	HMX	J (all detects)	P	Laboratory control samples (%R)
500-45457-1	JP-L1-GWMW131	1,3-Dinitrobenzene	J (all detects)	A	Compound quantitation and RLs (column difference)
500-45457-1	JP-L1-GWWES1	1,3,5-Trinitrobenzene 4-Amino-2,6-dinitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (column difference)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-L3-SW004-0412**

Lab Sample ID: 500-45457-2
Client Matrix: Water

Date Sampled: 04/12/2012 1030
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 0907			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	111		70 - 130

05/22/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-L1-GWMW131**

Lab Sample ID: 500-45457-16
Client Matrix: Water

Date Sampled: 04/12/2012 1600
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330
Prep Method: 3535
Dilution: 10
Analysis Date: 04/18/2012 0941
Prep Date: 04/17/2012 0940

Analysis Batch: 500-146545
Prep Batch: 500-146630

Instrument ID: INST35-36
Initial Weight/Volume: 770 mL
Final Weight/Volume: 6.0 mL
Injection Volume: 100 uL
Result Type: PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1		1.2	3.1
RDX	<1.6	*	0.77	1.6
1,3,5-Trinitrobenzene	<1.6		0.39	1.6
1,3-Dinitrobenzene	5.4 J		0.33	1.6
Nitrobenzene	<1.6		0.32	1.6
Tetryl	<3.9		0.65	3.9
2,4-Dinitrotoluene	<3.1		0.32	3.1
2,6-Dinitrotoluene	<3.1		0.71	3.1
2-Amino-4,6-dinitrotoluene	65		0.35	3.1
4-Amino-2,6-dinitrotoluene	70		0.74	3.1
2-Nitrotoluene	<3.1		0.82	3.1
4-Nitrotoluene	<3.1		0.82	3.1
3-Nitrotoluene	<3.1		1.4	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	296	X	70 - 130

05/22/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-L1-GWMW131**

Lab Sample ID: 500-45457-16
Client Matrix: Water

Date Sampled: 04/12/2012 1600
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	500			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 0027	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,6-Trinitrotoluene	2200		18	80

05/22/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-L1-GWWES1**

Lab Sample ID: 500-45457-17
Client Matrix: Water

Date Sampled: 04/12/2012 1422
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 1049			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1		1.2	3.1
RDX	<1.6	*	0.77	1.6
1,3,5-Trinitrobenzene	40 J		0.39	1.6
1,3-Dinitrobenzene	<1.6		0.33	1.6
Nitrobenzene	3.9		0.32	1.6
2,4,6-Trinitrotoluene	38		0.36	1.6
Tetryl	<3.9		0.65	3.9
2,4-Dinitrotoluene	<3.1		0.32	3.1
2,6-Dinitrotoluene	<3.1		0.71	3.1
2-Amino-4,6-dinitrotoluene	13		0.35	3.1
4-Amino-2,6-dinitrotoluene	21 J		0.74	3.1
2-Nitrotoluene	<3.1		0.82	3.1
4-Nitrotoluene	<3.1		0.82	3.1
3-Nitrotoluene	<3.1		1.4	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	61	X	70 - 130

05/24/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-L1-SW550**

Lab Sample ID: 500-45457-18
Client Matrix: Water

Date Sampled: 04/12/2012 1330
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 1123			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	107		70 - 130

05/22/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-OA-GWMW118**

Lab Sample ID: 500-45457-20
Client Matrix: Water

Date Sampled: 04/13/2012 1250
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 1231			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31 U5		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	112		70 - 130

cas 5/22/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-OA-GWMW119**

Lab Sample ID: 500-45457-21
Client Matrix: Water

Date Sampled: 04/13/2012 1250
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 1305			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31 U		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	110		70 - 130

05/12/12

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID: **JP-OA-GWMW117**

Lab Sample ID: 500-45457-22
Client Matrix: Water

Date Sampled: 04/13/2012 1200
Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146545	Instrument ID:	INST35-36
Prep Method:	3535	Prep Batch:	500-146630	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/18/2012 1339			Injection Volume:	100 uL
Prep Date:	04/17/2012 0940			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31 U5		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	119		70 - 130

CS/22/12

LDC #: 27605A40
SDG #: 500-45457-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 5/15/12
Page: 1 of 1
Reviewer: MA
2nd Reviewer: CA

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/12-4/13/12
II	Initial calibration	A	%RSD ≤ 20%
III.	Calibration verification/ICV	SW	%D ≤ 15%, ICV/CCV
IV.	Blanks	A	
V	Surrogate recovery	SW	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	SW	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	SW ~~N~~	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: WATER

1	JP-L3-SW004-0412	11	146630MB	21		31	
2	JP-L1-GWMW131	12		22		32	
3	JP-L1-GWWES1	13		23		33	
4	JP-L1-SW550	14		24		34	
5	JP-OA-GWMW118	15		25		35	
6	JP-OA-GWMW119	16		26		36	
7	JP-OA-GWMW117	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/___HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_____

LDC #: 27605A40

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: 1 of 1
Reviewer: AA
2nd Reviewer:

METHOD: __ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

What type of continuing calibration calculation was performed? ✓ %D or __ %R

[✓ Y] N N/A Were continuing calibration standards analyzed at the required frequencies?

Y [✓ N] N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?

Level IV Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D ≤ 15% (Limit ~~≤ 20.0~~)	RT (limit)	Associated Samples	Qualifications
	4/18/12	04041244-070D	UC5 ODS ~~NS~~	L	17.5	( )	5-7	J/UJ/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 27605A40

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: MA
2nd Reviewer: [signature]

METHOD: __ GC __ HPLC
Are surrogates required by the method? Yes ✓ or No ____.
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	2 (10X)	~~PRIMARY~~ ~~N/S~~ VC5uODS	Z	296 (54-148)	No Qual.
	↓	↓	↓	~~590~~ (↓)	↓
				( )	
	2 (500X)	~~N/S~~ VC5uODS	Z	~~DO~~ 0 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	1,2-DINITROBENZENE
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 27605A40

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A — Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A — Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level ~~IV/D~~ Only

Y N (N/A) — Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	~~04041235-04~~ 054/-055D	A	116 (80-115)	121 (80-115)	( )	All + Blk	J/P dets.
	LCS/500-146630/		( )	( )	( )		
	D /27A	I	( )	( )	( )		

LCSNew.wpd

LDC #: 27605A40
~~SDG #:~~

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: ~~MA~~
2nd Reviewer:

METHOD: __ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N (N/A) Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N ~~N/A~~ Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	D	2	130.1	J/A dets.
				↓
	C	3	~~190~~ 189.8	
	H	↓	~~64~~ 63.5	↓

Comments: _____

LDC Validation Report #27649

(April 2012 Samples)

Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437 **Web** www.lab-data.com **Fax** 760.634.0439

Toltest.
5201 Jewell Lane
Poducah KY 42001
ATTN: Mr. Gary Reside

May 31, 2012

SUBJECT: JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 15, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27649:

SDG #	Fraction
500-45518-1 500-45519-1 500-45521-1	Volatiles, Semivolatiles, Dissolved Metals, Wet Chemistry, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

L:\Toltest\JOAAP\27649COV.wpd

Attachment 1

Level III EDD — **LDC #27649 (Toltest-Poducah,KY / JOAAP-GW)**

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		SVOA (8270C)		Diss. Metals (SW846)		Expl. (8330)		Diss. NO_3-N (300.0)		Diss. SO_4 (300.0)																					
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	500-45518-1	05/15/12	06/06/12	7	0	7	0	7	0	7	0	7	0	7	0																		
B	500-45519-1	05/15/12	06/06/12	5	0	4	0	4	0	5	0	4	0	5	0																		
C	500-45521-1	05/15/12	06/06/12	-	-	-	-	-	-	10	0	-	-	-	-																		
Total	A/CR			12	0	11	0	11	0	22	0	11	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808
JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW999
JP-M13-GWMW809
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW126RMS
JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
4/20/12	Isopropylbenzene	20.4	All samples in SDG 500-45518-1	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No volatiles were detected in any of the samples.

JOAAP-GW
Volatiles - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Isopropylbenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

JOAAP-GW
Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW
Volatiles - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0151
Prep Date: 04/27/2012 0151

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-01.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 U		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45518-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0151			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0151				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	91		75 - 120
Dibromofluoromethane	92		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	99		85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45518-02.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0214			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0214				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0214
Prep Date: 04/27/2012 0214

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-02.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	0.23	J	0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	86		75 - 120
Dibromofluoromethane	91		85 - 115
1,2-Dichloroethane-d4 (Surr)	93		70 - 120
Toluene-d8 (Surr)	97		85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0238
Prep Date: 04/27/2012 0238

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-03.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 U5		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45518-03.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0238			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0238				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	92		75 - 120
Dibromofluoromethane	98		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	105		85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0302
Prep Date: 04/27/2012 0302

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-04.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 U5		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

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Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45518-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0302			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0302				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	91		75 - 120
Dibromofluoromethane	93		85 - 115
1,2-Dichloroethane-d4 (Surr)	97		70 - 120
Toluene-d8 (Surr)	98		85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0325
Prep Date: 04/27/2012 0325

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-05.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0325
Prep Date: 04/27/2012 0325

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-05.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	92		75 - 120
Dibromofluoromethane	96		85 - 115
1,2-Dichloroethane-d4 (Surr)	96		70 - 120
Toluene-d8 (Surr)	101		85 - 120

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0349
Prep Date: 04/27/2012 0349

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-06.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 U		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0349
Prep Date: 04/27/2012 0349

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-06.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	92		75 - 120
Dibromofluoromethane	95		85 - 115
1,2-Dichloroethane-d4 (Surr)	99		70 - 120
Toluene-d8 (Surr)	101		85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0412
Prep Date: 04/27/2012 0412

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-07.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 U5		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0412
Prep Date: 04/27/2012 0412

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45518-07.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	91		75 - 120
Dibromofluoromethane	95		85 - 115
1,2-Dichloroethane-d4 (Surr)	96		70 - 120
Toluene-d8 (Surr)	102		85 - 120

05/30/12

LDC #: 27649A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/24/12
SDG #: 500-45518-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: R
2nd Reviewer: CR

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/16/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 30/15
IV.	Continuing calibration/ICV	SW	ccv/icv ≤ 20
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 3+4
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: W

1	JP-M13-GWMW808	11 [1]	MB 500-147778	21		31	
2	JP-M13-GWMW126R	12 [2]	↓ 147785	22		32	
3	JP-M13-GWMW362	13		23		33	
4	JP-M13-GWMW999	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW806	16		26		36	
7	JP-M13-GWMW807	17		27		37	
8 [2]	JP-M13-GWMW126RMS	18		28		38	
9 [2]	JP-M13-GWMW126RMSD	19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 27649A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: AC
2nd Reviewer: OR

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/30/12	1950419 (1a)	VV	20.4		All	J/UJ/A

CONCAL.1SB

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808
JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW999
JP-M13-GWMW809
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW126RMS
JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals with the following exceptions:

Sample	Compound	Total Time From DFTPP Tuning Until Analysis	Required Analysis Time (in Hours) From DFTPP Tuning Until Analysis	Flag	A or P
JP-M13-GWMW126RMS	All TCL compounds	12 hrs. 25 min.	12 hrs.	None	P
JP-M13-GWMW126RMSD	All TCL compounds	12 hrs. 47 min.	12 hrs.	None	P

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
5/1/12	N-Nitrosodimethylamine	33.0	All samples in SDG 500-45518-1	J (all detects)	A
	3&4-Methylphenol	19.0		J (all detects)	
	Dibenzofuran	17.0		J (all detects)	
	Di-n-butylphthalate	17.0		J (all detects)	
	Benzo(k)fluoranthene	22.0		J (all detects)	

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/1/12	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	20.3 21.3 20.5	All samples in SDG 500-45518-1	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW126RMS/MSD (JP-M13-GWMW126R)	N-Nitrosodimethylamine Benzoic acid	- -	- -	65 (≤30) 32 (≤30)	J (all detects) J (all detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
2,4-Dinitrotoluene	3.3	2.6	-	0.7 (≤1.3)	-	-
2,6-Dinitrotoluene	0.25	0.29	-	0.04 (≤0.47)	-	-

JOAAP-GW
Semivolatiles - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Initial calibration (%RSD)
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-45518-1	JP-M13-GWMW126R	N-Nitrosodimethylamine Benzoic acid	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD)

JOAAP-GW
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW
Semivolatiles - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2103
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-1.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JS JS

02 5/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2103
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-1.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47	B	0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	32		20 - 110
Phenol-d5	25		10 - 115
Nitrobenzene-d5	63		40 - 110
2-Fluorobiphenyl	72		50 - 110
2,4,6-Tribromophenol	83		40 - 125
Terphenyl-d14	80		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2125
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-2.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7	UJ	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

05/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2125
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-2.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47	U	0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	30		20 - 110
Phenol-d5	22		10 - 115
Nitrobenzene-d5	55		40 - 110
2-Fluorobiphenyl	59		50 - 110
2,4,6-Tribromophenol	67		40 - 125
Terphenyl-d14	81		50 - 135

05/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2148
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-3.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9 JJ		0.33	1.9
Di-n-butyl phthalate	<4.7 JJ		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	3.3		0.28	1.3
2,6-Dinitrotoluene	0.25	J	0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

05/29/12

Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW362

Lab Sample ID: 500-45518-3

Client Matrix: Water

Date Sampled: 04/16/2012 1600

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Prep Method: 3510C

Dilution: 1.0

Analysis Date: 05/02/2012 2148

Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426

Prep Batch: 500-146890

Instrument ID: CMS12

Lab File ID: 45518-3.D

Initial Weight/Volume: 1070 mL

Final Weight/Volume: 1.0 mL

Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47	U	0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	27		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	52		40 - 110
2-Fluorobiphenyl	51		50 - 110
2,4,6-Tribromophenol	77		40 - 125
Terphenyl-d14	76		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2211			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	2.6		0.28	1.3
2,6-Dinitrotoluene	0.29	J	0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

CRS 5/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2211			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	29		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	53		40 - 110
2-Fluorobiphenyl	55		50 - 110
2,4,6-Tribromophenol	64		40 - 125
Terphenyl-d14	83		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2234			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

05/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2234			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	28		20 - 110
Phenol-d5	18		10 - 115
Nitrobenzene-d5	53		40 - 110
2-Fluorobiphenyl	53		50 - 110
2,4,6-Tribromophenol	60		40 - 125
Terphenyl-d14	75		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-6.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2256			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	SJ	0.33	1.9
Di-n-butyl phthalate	<4.7	SJ	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

ORS/29/12 05/08/2012

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-6.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2256			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U3		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	26		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	55		40 - 110
2-Fluorobiphenyl	55		50 - 110
2,4,6-Tribromophenol	66		40 - 125
Terphenyl-d14	77		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C
Prep Method: 3510C
Dilution: 1.0
Analysis Date: 05/02/2012 2319
Prep Date: 04/19/2012 0759

Analysis Batch: 500-148426
Prep Batch: 500-146890

Instrument ID: CMS12
Lab File ID: 45518-7.D
Initial Weight/Volume: 1070 mL
Final Weight/Volume: 1.0 mL
Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	J	0.33	1.9
Di-n-butyl phthalate	<4.7	J	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

CRS 5/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45518-7.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2319			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47	U	0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	31		20 - 110
Phenol-d5	22		10 - 115
Nitrobenzene-d5	58		40 - 110
2-Fluorobiphenyl	57		50 - 110
2,4,6-Tribromophenol	70		40 - 125
Terphenyl-d14	78		50 - 135

LDC #: 27649A2 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/24/12
SDG #: 500-45518-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: SK
2nd Reviewer: AC

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/16/12
II.	GC/MS Instrument performance check	SW	
III.	Initial calibration	SW	%RSD ≤ 30/LC, r²
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3+4
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: W

1	JP-M13-GWMW808	11	MB 500-68990/4-A	21		31	
2	JP-M13-GWMW126R	12		22		32	
3	JP-M13-GWMW362	13		23		33	
4	JP-M13-GWMW999	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW806	16		26		36	
7	JP-M13-GWMW807	17		27		37	
8	JP-M13-GWMW126RMS	18		28		38	
9	JP-M13-GWMW126RMSD	19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA

A. Phenol	S. Naphthalene	KK. 2,4-Dinitrotoluene	CCC. Benzo(a)anthracene	UUU.Benzo(b)thiophene
B. Bis (2-chloroethyl) ether	T. 4-Chloroaniline	LL. Diethylphthalate	DDD. Chrysene	VVV.Naphthobenzothiophene
C. 2-Chlorophenol	U. Hexachlorobutadiene	MM. 4-Chlorophenyl-phenyl ether	EEE. Bis(2-ethylhexyl)phthalate	WWW.Benzo(e)pyrene
D. 1,3-Dichlorobenzene	V. 4-Chloro-3-methylphenol	NN. Fluorene	FFF. Di-n-octylphthalate	XXX. 2,6-Dimethylnaphthalene
E. 1,4-Dichlorobenzene	W. 2-Methylnaphthalene	OO. 4-Nitroaniline	GGG. Benzo(b)fluoranthene	YYY. 2,3,5-Trimethylnaphthalene
F. 1,2-Dichlorobenzene	X. Hexachlorocyclopentadiene	PP. 4,6-Dinitro-2-methylphenol	HHH. Benzo(k)fluoranthene	ZZZ. Perylene
G. 2-Methylphenol	Y. 2,4,6-Trichlorophenol	QQ. N-Nitrosodiphenylamine (1)	III. Benzo(a)pyrene	AAAA. Dibenzothiophene
H. 2,2'-Oxybis(1-chloropropane)	Z. 2,4,5-Trichlorophenol	RR. 4-Bromophenyl-phenylether	JJJ. Indeno(1,2,3-cd)pyrene	BBBB. Benzo(a)fluoranthene
I. 4-Methylphenol	AA. 2-Chloronaphthalene	SS. Hexachlorobenzene	KKK. Dibenz(a,h)anthracene	CCCC. Benzo(b)fluorene
J. N-Nitroso-di-n-propylamine	BB. 2-Nitroaniline	TT. Pentachlorophenol	LLL. Benzo(g,h,i)perylene	DDDD. cis/trans-Decalin
K. Hexachloroethane	CC. Dimethylphthalate	UU. Phenanthrene	MMM. Bis(2-Chloroisopropyl)ether	EEEE. Biphenyl
L. Nitrobenzene	DD. Acenaphthylene	VV. Anthracene	NNN. Aniline	FFFF. Retene
M. Isophorone	EE. 2,6-Dinitrotoluene	WW. Carbazole	OOO. N-Nitrosodimethylamine	GGGG. C30-Hopane
N. 2-Nitrophenol	FF. 3-Nitroaniline	XX. Di-n-butylphthalate	PPP. Benzoic Acid	HHHH. 1-Methylphenanthrene
O. 2,4-Dimethylphenol	GG. Acenaphthene	YY. Fluoranthene	QQQ. Benzyl alcohol	IIII. 2-Naphthylamine
P. Bis(2-chloroethoxy)methane	HH. 2,4-Dinitrophenol	ZZ. Pyrene	RRR. Pyridine	JJJJ. 1,4-Dioxane
Q. 2,4-Dichlorophenol	II. 4-Nitrophenol	AAA. Butylbenzylphthalate	SSS. Benzidine	KKKK.
R. 1,2,4-Trichlorobenzene	JJ. Dibenzofuran	BBB. 3,3'-Dichlorobenzidine	TTT. 1-Methylnaphthalene	LLLL.

LDC #: 27649A2

VALIDATION FINDINGS WORKSHEET
GC/MS Performance Check

Reviewer: N
2nd Reviewer: DR

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the DFTPP performance results reviewed and found to be within the EPA Functional Guideline criteria?

Y (N) N/A Were all samples analyzed within the 12 hour clock criteria?

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples Client ID	Qualifications
	8	12 hrs 25 mins			none/P
	9	12 hrs 47 mins			J

m/z	ION ABUNDANCE CRITERIA
51	30.0 - 60.0% of m/z 198
68	Less than 2.0% of m/z 69
69	Present
70	Less than 2.0% of 69
127	40.0 - 60.0% of m/z 198
197	Less than 1.0% of m/z 198
198	Base peak, 100% relative abundance

m/z	ION ABUNDANCE CRITERIA
199	5.0 - 9.0% of m/z 198
275	10.0 - 30.0% of m/z 198
365	Greater than 1.0% of m/z 198
441	Present, but less than m/z 443
442	Greater than 40.0% of m/z 198
443	17.0 - 23.0% of m/z 442

LDC #: 27649A2

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: JK
2nd Reviewer: CR

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/1/12	ICAL	DDD	33.0		All	J (all) / A
			3&4 Methylphenol	19.0			
			JJJ	17.0			
			XX	17.0			
			HHH	22.0			

LDC #: 27649A2

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: SR
2nd Reviewer: CR

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A — Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Y (N) N/A — Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A — Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/1/12	ICV1	W	20.3		All	J/UJ/A
			JJ	21.3			↓
			XX	20.5			↓

CONCAL.2S

LDC #: 27649A2

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 8
2nd Reviewer: CR

METHOD: GC/MS BNA

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8/9	DDD	( )	( )	65 (≤30)	2	Jdets/A
			PPP	( )	( )	32 (↓)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 27649A2

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: K
2nd Reviewer: DL

METHOD: GC/MS SVOA

Compound	Concentration (ug/L)		RPD	(ug/L) Difference	(ug/L) Limits	
	3	4				
KK	3.3	2.6		0.7	(≤ 1.3)	No qual
EE	0.25	0.29		0.04	(≤ 0.47)	↓

V:\FIELD DUPLICATES\27649A2.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 18, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808
JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW999
JP-M13-GWMW809
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW126RMS
JP-M13-GWMW126RMSD
JP-M13-GWMW126RDUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW126RMS/MSD (All samples in SDG 500-45518-1)	Magnesium Sodium Mercury	-	70 (80-120) 76 (80-120) 77 (80-120)	-	J (all detects) UJ (all non-detects)	A

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
Aluminum	0.034	0.20U	-	0.166 (≤0.40)	-	-
Barium	0.041	0.042	-	0.001 (≤0.020)	-	-
Cadmium	0.00098	0.0010	-	0.00002 (≤0.0040)	-	-
Calcium	150	150	0	-	-	-
Iron	0.14	0.38	-	0.24 (≤0.40)	-	-
Magnesium	89	93	4	-	-	-
Manganese	0.078	0.078	0	-	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
Nickel	0.0042	0.0063	-	0.0021 (≤0.020)	-	-
Potassium	5.8	6.0	3	-	-	-
Sodium	200	210	5	-	-	-
Zinc	0.020U	0.011	-	0.009 (≤0.040)	-	-

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Magnesium Sodium Mercury	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0032
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.14		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00081	J	0.00054	0.0020
Calcium	100		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.016		0.0010	0.0050
Copper	0.0011	J	0.0011	0.010
Iron	2.6		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	59 J		0.024	0.10
Manganese	0.89		0.0011	0.010
Nickel	0.026		0.0019	0.010
Potassium	8.3		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	56 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0069	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1058
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 U		0.070	0.20

05/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0036
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.048		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00078	J	0.00054	0.0020
Calcium	61		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	39 J		0.024	0.10
Manganese	0.0032	J	0.0011	0.010
Nickel	0.0022	J	0.0019	0.010
Potassium	2.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	25 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0090	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1105
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 UJ		0.070	0.20

05/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0109
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.034	J	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.041		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00098	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.14	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	89 J		0.024	0.10
Manganese	0.078		0.0011	0.010
Nickel	0.0042	J	0.0019	0.010
Potassium	5.8		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	200 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1112
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 UJ		0.070	0.20

CRS 5/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0116
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.042		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0010	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.38		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	93 J		0.024	0.10
Manganese	0.078		0.0011	0.010
Nickel	0.0063	J	0.0019	0.010
Potassium	6.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	210 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.011	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1114
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 UJ		0.070	0.20

CRS 5/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0123
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.028	J	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.028		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00065	J	0.00054	0.0020
Calcium	38		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.094	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	29 J		0.024	0.10
Manganese	0.0024	J	0.0011	0.010
Nickel	0.0044	J	0.0019	0.010
Potassium	2.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0073	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1116
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 UJ		0.070	0.20

CRS 5/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0127
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.082		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00068	J	0.00054	0.0020
Calcium	68		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	40 J		0.024	0.10
Manganese	0.0024	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	22 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.013	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1117
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 UJ		0.070	0.20

CR 5/24/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 0131
Prep Date: 04/27/2012 0930

Analysis Batch: 500-147970
Prep Batch: 500-147886

Instrument ID: ICP6
Lab File ID: P6042712C.asc
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.088		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00098	J	0.00054	0.0020
Calcium	160		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.59		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	79 J		0.024	0.10
Manganese	0.11		0.0011	0.010
Nickel	0.0025	J	0.0019	0.010
Potassium	7.2		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	380 J		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0095	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1119
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20 U		0.070	0.20

crs 5/24/12

LDC #: 27649A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-17-12

SDG #: 500-45518-1 Level III Page: 1 of 1

Laboratory: Test America, Inc. 9m4 Reviewer: MG

2nd Reviewer:

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-16-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	SW	MS/MSD
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	D = 3 + 4
XV	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all Water

1	JP-M13-GWMW808	11		21		31	
2	JP-M13-GWMW126R	12		22		32	
3	JP-M13-GWMW362	13		23		33	
4	JP-M13-GWMW999	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW806	16		26		36	
7	JP-M13-GWMW807	17		27		37	
8	JP-M13-GWMW126RMS	18		28		38	
9	JP-M13-GWMW126RMSD	19		29		39	
10	JP-M13-GWMW126RDUP	20	FBW	30		40	

Notes:

LDC #: 27649A4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→7	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___ ___
QC 8→10	↓	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Analysis Method
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: [✓ Mercury by CVAA if performed]

LDC #: 27649A4

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: MG
2nd Reviewer: [signature]

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A — Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A — Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A — Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A — Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	8/9	water	Mg		70 (80-120)		all	J/UJ/A
	↓	↓	Na		76 (↓)		↓	↓
			Hg		77 ( )			

Comments:

LDC#: 27649A4 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 6010B/6020/7000)

(Y) N NA Were field duplicate pairs identified in this SDG?
(Y) N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (mg/L) 3	Concentration (mg/L) 4	(≤25) RPD	(mg/L) Difference	(mg/L) Limits	Qualifications (Parent Only)
Aluminum	0.034	0.20U		0.166	(≤0.40)	
Barium	0.041	0.042		0.001	(≤0.020)	
Cadmium	0.00098	0.0010		0.00002	(≤0.0040)	
Calcium	150	150	0			
Iron	0.14	0.38		0.24	(≤0.40)	
Magnesium	89	93	4			
Manganese	0.078	0.078	0			
Nickel	0.0042	0.0063		0.0021	(≤0.020)	
Potassium	5.8	6.0	3			
Sodium	200	210	5			
Zinc	0.020U	0.011		0.009	(≤0.040)	

V:\FIELD DUPLICATES\FD_inorganic\27649A4.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16 2012

LDC Report Date: May 23, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808
JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW999
JP-M13-GWMW809
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW126RMS
JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate and Dissolved Nitrate as Nitrogen.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
JP-M13-GWMW999	Nitrate as N	52.00 hours	48 hours	J (all detects) UJ (all non-detects)	P
JP-M13-GWMW809	Nitrate as N	50.75 hours	48 hours	J (all detects) UJ (all non-detects)	P
JP-M13-GWMW806	Nitrate as N	52.25 hours	48 hours	J (all detects) UJ (all non-detects)	P
JP-M13-GWMW807	Nitrate as N	54.00 hours	48 hours	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
Sulfate	270	270	0 (≤25)	-	-	-

JOAAP-GW
Dissolved Sulfate - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Nitrate as N	J (all detects) UJ (all non-detects)	P	Technical holding times

JOAAP-GW
Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

General Chemistry

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-45518-1
Client Matrix: Water

Date Sampled: 04/16/2012 1405
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<0.10		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1256						
Sulfate-Dissolved	88		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1311						

CRS 5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.13		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1325						
Sulfate-Dissolved	52		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1339						

CRS 5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0		mg/L	0.23	1.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1505						
Sulfate-Dissolved	270		mg/L	4.5	10	50	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0358						

CR 5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0	H	mg/L	0.23	1.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1603						
Sulfate-Dissolved	270		mg/L	4.5	10	50	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0413						

QRS 5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.13 J	H	mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1617							
Sulfate-Dissolved	5.4		mg/L	0.090	0.20	1.0	300.0
Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1617							

QR 5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.39 J	H	mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1645						
Sulfate-Dissolved	80		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1700						

QR5/24/12

General Chemistry

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0 05	H	mg/L	0.23	1.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1728						
Sulfate-Dissolved	230		mg/L	4.5	10	50	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0427						

QRS 5/24/12

LDC #: 27649A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-17-12
SDG #: 500-45518-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: ✓

METHOD: Dissolved Nitrate-N, Dissolved Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 4-16-12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	D = 3+4
XI	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: all water

1	JP-M13-GWMW808	11		21		31	
2	JP-M13-GWMW126R	12		22		32	
3	JP-M13-GWMW362	13		23		33	
4	JP-M13-GWMW999	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW806	16		26		36	
7	JP-M13-GWMW807	17		27		37	
8	JP-M13-GWMW126RMS	18		28		38	
9	JP-M13-GWMW126RMSD	19		29		39	
10		20	PBW	30		40	

Notes: ICAL, ICV, CCV, ICB, CCB reported in "B", SDG: 500-45519-1

LDC #: 27649A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→7	W	pH TDS Cl F **NO_3** NO_2 **SO_4** PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
QC 8, 9	↓	pH TDS Cl F **NO_3** NO_2 **SO_4** PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments: ____________________

LDC #: 27649 A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: MG
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	300.0					
Parameters:	NO3-N					
Technical holding time:	48 hr					

Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
4	12:00 4-16-12	16:03 4-18-12	(52.00 hr)				J/UJ/P
5	13:27 4-16-12	16:17 4-18-12	(50.75				
6	12:23 4-16-12	16:45 4-18-12	(52.25				
7	11:27 4-16-12	17:28 4-18-12	(54.00				

LDC#: 27649A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: MG

2nd Reviewer:

Inorganics, Method 300.0

Analyte	Concentration (mg/L)		RPD (≤25)	Difference	Limits	Qualification (Parent only)
	3	4				
Sulfate	270	270	0			

V:\FIELD DUPLICATES\FD_inorganic\27649A6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 25, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808
JP-M13-GWMW126R
JP-M13-GWMW362
JP-M13-GWMW999
JP-M13-GWMW809
JP-M13-GWMW806
JP-M13-GWMW807
JP-M13-GWMW126RMS
JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/20/12	L3uPH	2,4,6-Trinitrotoluene	16.6	JP-M13-GWMW807	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M13-GWMW362	2-Nitrotoluene	79.0	J (all detects)	A

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
2,4,6-Trinitrotoluene	0.073	0.097	-	0.024 (≤0.80)	-	-
2,4-Dinitrotoluene	4.9	5.4	10 (≤25)	-	-	-
2-Amino-4,6-dinitrotoluene	1.2	1.2	-	0 (≤1.55)	-	-
4-Amino-2,6-dinitrotoluene	1.1	1.0	-	0.1 (≤1.55)	-	-
2-Nitrotoluene	0.24	2.0	-	1.76 (≤0.80)	J (all detects)	A

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M13-GWMW362	JP-M13-GWMW999				
4-Nitrotoluene	0.31U	1.9	-	1.59 (≤0.80)	J (all detects) UJ (all non-detects)	A
3-Nitrotoluene	0.31U	0.19	-	0.12 (≤0.80)	-	-

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW807	2,4,6-Trinitrotoluene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-45518-1	JP-M13-GWMW362	2-Nitrotoluene	J (all detects)	A	Compound quantitation and RLs (%D)
500-45518-1	JP-M13-GWMW362 JP-M13-GWMW999	2-Nitrotoluene	J (all detects)	A	Field duplicates (difference)
500-45518-1	JP-M13-GWMW362 JP-M13-GWMW999	4-Nitrotoluene	J (all detects) UJ (all non-detects)	A	Field duplicates (difference)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc. Job Number: 500-45518-1

Client Sample ID: JP-M13-GWMW808

Lab Sample ID: 500-45518-1 Date Sampled: 04/16/2012 1405
Client Matrix: Water Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 1413			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	98		70 - 130

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-45518-2
Client Matrix: Water

Date Sampled: 04/16/2012 1525
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 1505			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	0.35		0.082	0.31
4-Nitrotoluene	0.30	J	0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	112		70 - 130

C25/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-45518-3
Client Matrix: Water

Date Sampled: 04/16/2012 1600
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 1740			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	0.073	J	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	4.9		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	1.2		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.1		0.074	0.31
2-Nitrotoluene	0.24 J	J	0.082	0.31
4-Nitrotoluene	<0.31 U		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	105		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-45518-4
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 1831			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	0.097	J	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	5.4		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	1.2		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.0		0.074	0.31
2-Nitrotoluene	2.0		0.082	0.31
4-Nitrotoluene	1.9		0.082	0.31
3-Nitrotoluene	0.19	J	0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	109		70 - 130

CES/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-45518-5
Client Matrix: Water

Date Sampled: 04/16/2012 1327
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 1923			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	107		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-45518-6
Client Matrix: Water

Date Sampled: 04/16/2012 1223
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 2015			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	108		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-45518-7
Client Matrix: Water

Date Sampled: 04/16/2012 1127
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 2158			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	U	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	108		70 - 130

05/25/12

LDC #: 27649A40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/22/12
SDG #: 500-45518-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: M
2nd Reviewer: [signature]

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/16/12
II	Initial calibration	A	%RSD ≤ 20%
III.	Calibration verification/ICV	SW A	%D ≤ 15%, ICV/CCV
IV.	Blanks	A	
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	MS/D
VII.	Laboratory control samples	A SW	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	SW N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	SW	FD = 3,4
XIII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: WATER

1	JP-M13-GWMW808	11	147010MB	21		31	
2	JP-M13-GWMW126R	12		22		32	
3	JP-M13-GWMW362	13		23		33	
4	JP-M13-GWMW999	14		24		34	
5	JP-M13-GWMW809	15		25		35	
6	JP-M13-GWMW806	16		26		36	
7	JP-M13-GWMW807	17		27		37	
8	JP-M13-GWMW126RMS	18		28		38	
9	JP-M13-GWMW126RMSD	19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_____

LDC #: 27649A40

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: 1 of 1
Reviewer: PA
2nd Reviewer: C

METHOD: __ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ✓ %D or __ %R

[✓ Y] N N/A Were continuing calibration standards analyzed at the required frequencies?
Y [✓ N] N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?

Level IV Only
Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ ~~20.0~~ 15.0)	RT (limit)	Associated Samples	Qualifications
	4/20/12	~~04061240~~	L3uPH	G	16.6	( )	7	J/UJ/A
		04061240_180.d				( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 27649A40
SDG #: ———

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: M
2nd Reviewer: [signature]

METHOD: ___ GC _/_ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	L	3	79.0	J/A det.

Comments: _____

LDC#: 27649A40 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer: AA
2nd Reviewer: CR

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

(Y) N NA Were field duplicate pairs identified in this SDG?
Y (N) NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L) 3	Concentration (ug/L) 4	(≤ 25) RPD	(ug/L) Difference	Qualifications (Parent Only)
G	0.073	0.097		0.024 (Limit ≤ 0.80)	No Qual.
J	4.9	5.4	10		
I	1.2	1.2	~~0~~	0 (≤ 1.55)	
H	1.1	1.0		0.1 ~~(≤ 0.80)~~ (≤ 1.55)	
L	0.24	2.0		1.76 (≤ 0.80)	J/A duts.
N	0.31U	1.9		1.59 (≤ 0.80)	~~X~~ J/UJ/A

Analyte	Concentration (ug/L) 3	Concentration (ug/L) 4	(≤ 25) RPD	(ug/L) Difference	Qualifications (Parent Only)
M	0.31U	0.19 ~~1.9~~		0.12 (≤ 0.80)	No Qual.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802
JP-M11-GWMW805
JP-M11-GWMW335
JP-M11-GWMW336
JP-Tripblank-0412

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
4/20/12	Isopropylbenzene	20.4	All samples in SDG 500-45519-1	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample JP-Tripblank-0412 was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Volatiles - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW336 JP-Tripblank-0412	Isopropylbenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

JOAAP-GW
Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Volatiles - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0436
Prep Date: 04/27/2012 0436

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-02.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0	UJ	0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

CRS/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0436
Prep Date: 04/27/2012 0436

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-02.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	93		75 - 120
Dibromofluoromethane	101		85 - 115
1,2-Dichloroethane-d4 (Surr)	98		70 - 120
Toluene-d8 (Surr)	102		85 - 120

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0500
Prep Date: 04/27/2012 0500

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-03.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0500
Prep Date: 04/27/2012 0500

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-03.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	93		75 - 120
Dibromofluoromethane	95		85 - 115
1,2-Dichloroethane-d4 (Surr)	99		70 - 120
Toluene-d8 (Surr)	99		85 - 120

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0523
Prep Date: 04/27/2012 0523

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-04.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45519-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0523			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0523				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	90		75 - 120
Dibromofluoromethane	94		85 - 115
1,2-Dichloroethane-d4 (Surr)	96		70 - 120
Toluene-d8 (Surr)	98		85 - 120

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0546
Prep Date: 04/27/2012 0546

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-05.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0	U5	0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0546
Prep Date: 04/27/2012 0546

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-05.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	90		75 - 120
Dibromofluoromethane	98		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	100		85 - 120

025/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-Tripblank-0412**

Lab Sample ID: 500-45519-7TB
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B
Prep Method: 5030B
Dilution: 1.0
Analysis Date: 04/27/2012 0610
Prep Date: 04/27/2012 0610

Analysis Batch: 500-147778
Prep Batch: N/A

Instrument ID: CMS19
Lab File ID: 45519-07.D
Initial Weight/Volume: 5 mL
Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 UJ		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

05/30/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-Tripblank-0412**

Lab Sample ID: 500-45519-7TB
Client Matrix: Water

Date Sampled: 04/16/2012 1200
Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-147778	Instrument ID:	CMS19
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	45519-07.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	04/27/2012 0610			Final Weight/Volume:	5 mL
Prep Date:	04/27/2012 0610				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	92		75 - 120
Dibromofluoromethane	101		85 - 115
1,2-Dichloroethane-d4 (Surr)	99		70 - 120
Toluene-d8 (Surr)	102		85 - 120

CRS 5/30/12

LDC #: 27649B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/24/12
SDG #: 500-45519-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/16/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 30/15
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 20
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 5

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: W

1	JP-M11-GWMW802	11	MB 500-147778	21		31	
2	JP-M11-GWMW805	12		22		32	
3	JP-M11-GWMW335	13		23		33	
4	JP-M11-GWMW336	14		24		34	
5	JP-Tripblank-0412	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 27649.B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: ______

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y/N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	4/20/12	1950419 (1a)	VV	20.4		All	J/UJ/A

CONCAL.1SB

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802
JP-M11-GWMW805
JP-M11-GWMW335
JP-M11-GWMW336

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
5/1/12	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	33.0 19.0 17.0 17.0 22.0	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 MB 500-146890	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
4/25/12	Benzoic acid 2,4-Dinitrophenol	55.0 19.0	JP-M11-GWMW336	J (all detects) J (all detects)	A

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/4/12	N-Nitrosodimethylamine Benzoic acid 2,4-Dinitrophenol 4-Nitrophenol	41.8 44.4 32.5 25.6	JP-M11-GWMW336	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/1/12	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	20.3 21.3 20.5	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 MB 500-146890	J (all detects) UJ (all non-detects)	A
4/25/12	Benzoic acid	125.4	JP-M11-GWMW336	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Semivolatiles - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Initial calibration (%RSD)
500-45519-1	JP-M11-GWMW336	Benzoic acid 2,4-Dinitrophenol	J (all detects)	A	Initial calibration (%RSD)
500-45519-1	JP-M11-GWMW336	N-Nitrosodimethylamine Benzoic acid 2,4-Dinitrophenol 4-Nitrophenol	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-45519-1	JP-M11-GWMW336	Benzoic acid	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

JOAAP-GW
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Semivolatiles - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2342			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	J	0.33	1.9
Di-n-butyl phthalate	<4.7	J	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

QC 5/29/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/02/2012 2342			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	25		20 - 110
Phenol-d5	17		10 - 115
Nitrobenzene-d5	46		40 - 110
2-Fluorobiphenyl	49	X	50 - 110
2,4,6-Tribromophenol	56		40 - 125
Terphenyl-d14	72		50 - 135

05/24/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/03/2012 0004			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

05/29/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/03/2012 0004			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	25		20 - 110
Phenol-d5	17		10 - 115
Nitrobenzene-d5	48		40 - 110
2-Fluorobiphenyl	52		50 - 110
2,4,6-Tribromophenol	58		40 - 125
Terphenyl-d14	75		50 - 135

05/29/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/03/2012 0027			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

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05/29/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148426	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/03/2012 0027			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47	5	0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	26		20 - 110
Phenol-d5	19		10 - 115
Nitrobenzene-d5	53		40 - 110
2-Fluorobiphenyl	54		50 - 110
2,4,6-Tribromophenol	70		40 - 125
Terphenyl-d14	73		50 - 135

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148703	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/04/2012 1812			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3 U5		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 U5	^	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U5		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

5/29/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-148703	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-146890	Lab File ID:	45519-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	05/04/2012 1812			Final Weight/Volume:	1.0 mL
Prep Date:	04/19/2012 0759			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 U5		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	27		20 - 110
Phenol-d5	17		10 - 115
Nitrobenzene-d5	52		40 - 110
2-Fluorobiphenyl	47	X	50 - 110
2,4,6-Tribromophenol	58		40 - 125
Terphenyl-d14	71		50 - 135

05/29/12

LDC #: 27649B2 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/24/12
SDG #: 500-45519-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: R
2nd Reviewer: JV

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/16/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	%RSD ≤ 30/15, r2
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 20
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	JP-M13-GWMW026R -no recvd /no qual
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: W

1	JP-M11-GWMW802	11	MB 500-146890	21		31	
2	JP-M11-GWMW805	12		22		32	
3	JP-M11-GWMW335	13		23		33	
4	JP-M11-GWMW336	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA

A. Phenol	S. Naphthalene	KK. 2,4-Dinitrotoluene	CCC. Benzo(a)anthracene	UUU.Benzo(b)thiophene
B. Bis (2-chloroethyl) ether	T. 4-Chloroaniline	LL. Diethylphthalate	DDD. Chrysene	VVV.Naphthobenzothiophene
C. 2-Chlorophenol	U. Hexachlorobutadiene	MM. 4-Chlorophenyl-phenyl ether	EEE. Bis(2-ethylhexyl)phthalate	WWW.Benzo(e)pyrene
D. 1,3-Dichlorobenzene	V. 4-Chloro-3-methylphenol	NN. Fluorene	FFF. Di-n-octylphthalate	XXX. 2,6-Dimethylnaphthalene
E. 1,4-Dichlorobenzene	W. 2-Methylnaphthalene	OO. 4-Nitroaniline	GGG. Benzo(b)fluoranthene	YYY. 2,3,5-Trimethylnaphthalene
F. 1,2-Dichlorobenzene	X. Hexachlorocyclopentadiene	PP. 4,6-Dinitro-2-methylphenol	HHH. Benzo(k)fluoranthene	ZZZ. Perylene
G. 2-Methylphenol	Y. 2,4,6-Trichlorophenol	QQ. N-Nitrosodiphenylamine (1)	III. Benzo(a)pyrene	AAAA. Dibenzothiophene
H. 2,2'-Oxybis(1-chloropropane)	Z. 2,4,5-Trichlorophenol	RR. 4-Bromophenyl-phenylether	JJJ. Indeno(1,2,3-cd)pyrene	BBBB. Benzo(a)fluoranthene
I. 4-Methylphenol	AA. 2-Chloronaphthalene	SS. Hexachlorobenzene	KKK. Dibenz(a,h)anthracene	CCCC. Benzo(b)fluorene
J. N-Nitroso-di-n-propylamine	BB. 2-Nitroaniline	TT. Pentachlorophenol	LLL. Benzo(g,h,i)perylene	DDDD. cis/trans-Decalin
K. Hexachloroethane	CC. Dimethylphthalate	UU. Phenanthrene	MMM. Bis(2-Chloroisopropyl)ether	EEEE. Biphenyl
L. Nitrobenzene	DD. Acenaphthylene	VV. Anthracene	NNN. Aniline	FFFF. Retene
M. Isophorone	EE. 2,6-Dinitrotoluene	WW. Carbazole	OOO. N-Nitrosodimethylamine	GGGG. C30-Hopane
N. 2-Nitrophenol	FF. 3-Nitroaniline	XX. Di-n-butylphthalate	PPP. Benzoic Acid	HHHH. 1-Methylphenanthrene
O. 2,4-Dimethylphenol	GG. Acenaphthene	YY. Fluoranthene	QQQ. Benzyl alcohol	IIII. 2-Naphthylamine
P. Bis(2-chloroethoxy)methane	HH. 2,4-Dinitrophenol	ZZ. Pyrene	RRR. Pyridine	JJJJ. 1,4-Dioxane
Q. 2,4-Dichlorophenol	II. 4-Nitrophenol	AAA. Butylbenzylphthalate	SSS. Benzidine	KKKK.
R. 1,2,4-Trichlorobenzene	JJ. Dibenzofuran	BBB. 3,3'-Dichlorobenzidine	TTT. 1-Methylnaphthalene	LLLL.

LDC #: 27649B2

VALIDATION FINDINGS WORKSHEET

Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- (Y) N N/A — Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
- (Y) N N/A — Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
- (Y) N N/A — Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?________
- (Y) N N/A — Did the initial calibration meet the acceptance criteria?
- Y (N) N/A — Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/1/12	ICAL	OOO	33.0		1-3	J dets/A
			3&4-Methylphenol	19.0		MB 500-146890	↓
			JJ	17.0			↓
			XX	17.0			↓
			HHH	22.0			↓
	4/25/12	ICAL	PPP	55.0		4	J dets/A
			HH	19.0			↓

INICAL.2S

LDC #: 27649B2

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: SR
2nd Reviewer: CR

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
Y (N) N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	5/1/12	ICV1	W	20.3		1-3	J/UJ/A
			JJ	21.3		MB 500-146890	↓
			XX	20.5			↓
	4/25/12	ICVMIX1	PPP	125.4		4	J/UJ/A
							↓
	5/4/12	21C0504B	OOO	41.8		4	↓
			PPP	44.4			↓
			~~X~~	~~23.5~~			↓
			HH	32.5			↓
			II	25.6			↓

CONCAL.2S

LDC #: 27649B2

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer: A
2nd Reviewer: Y

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		4	FBP	47 (50-110)	no qual
				( )	
		1	FBP	49 (50-110)	No Qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 18, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802
JP-M11-GWMW805
JP-M11-GWMW335
JP-M11-GWMW336

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Dissolved Metals - Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-148076	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-147889	Lab File ID:	P50428B
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	04/28/2012 2307			Final Weight/Volume:	50 mL
Prep Date:	04/27/2012 0930				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.026		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	75		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0012	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	34		0.024	0.10
Manganese	0.75		0.0011	0.010
Nickel	0.0023	J	0.0019	0.010
Potassium	2.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0025	J	0.00062	0.0050
Zinc	0.0078	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-147745	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-147564	Lab File ID:	042612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	04/26/2012 1121			Final Weight/Volume:	25 mL
Prep Date:	04/25/2012 1000				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

05/22/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-148076	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-147889	Lab File ID:	P50428B
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	04/28/2012 2320			Final Weight/Volume:	50 mL
Prep Date:	04/27/2012 0930				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.028		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	110		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0016	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	75		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	0.0059	J	0.0019	0.010
Potassium	9.5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0037	J	0.00062	0.0050
Zinc	0.0078	J	0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-148076	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-147889	Lab File ID:	P50428B
Dilution:	10			Initial Weight/Volume:	50 mL
Analysis Date:	04/28/2012 2327			Final Weight/Volume:	50 mL
Prep Date:	04/27/2012 0930				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	97		1.2	10

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-147745	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-147564	Lab File ID:	042612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	04/26/2012 1217			Final Weight/Volume:	25 mL
Prep Date:	04/25/2012 1000				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

CRS 12/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-148076	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-147889	Lab File ID:	P50428B
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	04/28/2012 2333			Final Weight/Volume:	50 mL
Prep Date:	04/27/2012 0930				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.021		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	210		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0051	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	140		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	0.0024	J	0.0019	0.010
Potassium	6.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	48		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0047	J	0.00062	0.0050
Zinc	0.0047	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-147745	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-147564	Lab File ID:	042612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	04/26/2012 1219			Final Weight/Volume:	25 mL
Prep Date:	04/25/2012 1000				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

CRS 5/22/12

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 1.0
Analysis Date: 04/28/2012 2346
Prep Date: 04/27/2012 0930

Analysis Batch: 500-148076
Prep Batch: 500-147889

Instrument ID: ICP5
Lab File ID: P50428B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.020		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	120		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0011	J	0.0011	0.010
Iron	0.15	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	80		0.024	0.10
Manganese	0.033		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	4.1		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	J	0.00062	0.0050
Zinc	0.0069	J	0.0047	0.020

Analysis Method: 6010B
Prep Method: 3010A
Dilution: 10
Analysis Date: 04/28/2012 2352
Prep Date: 04/27/2012 0930

Analysis Batch: 500-148076
Prep Batch: 500-147889

Instrument ID: ICP5
Lab File ID: P50428B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Sodium	56		1.2	10

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A
Prep Method: 7470A
Dilution: 1.0
Analysis Date: 04/26/2012 1221
Prep Date: 04/25/2012 1000

Analysis Batch: 500-147745
Prep Batch: 500-147564

Instrument ID: HG6
Lab File ID: 042612R.CSV
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.070	0.20

05/22/12

LDC #: 27649B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-17-12

SDG #: 500-45519-1 Level III Page: 1 of 1

Laboratory: Test America, Inc. 9MG. Reviewer: MG

2nd Reviewer: ✓

METHOD: Dissolved Metals (EPA SW 846 Method 6010B/~~7000~~) 7470A

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-16-12
II.	ICP/MS Tune	N	not utilized
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	N	client specified
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	not utilized
X.	Furnace Atomic Absorption QC	N	" "
XI.	ICP Serial Dilution	N	not performed
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: all water

1	JP-M11-GWMW802	11		21		31	
2	JP-M11-GWMW805	12		22		32	
3	JP-M11-GWMW335	13		23		33	
4	JP-M11-GWMW336	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20	PBW	30		40	

Notes: _____

LDC #: 27649B4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: ✓

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1→4	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Analysis Method		
ICP	W	[✓ Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn] Hg [✓ Ni, K, Se, Ag, Na, Tl, V, Zn] Mo, B, Si, CN^-, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: [✓ Mercury by CVAA if performed]

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16 through April 17, 2012

LDC Report Date: May 18, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802
JP-M11-GWMW805
JP-M11-GWMW335
JP-M11-GWMW336
JP-M9-GWMW330
JP-M9-GWMW330MS
JP-M9-GWMW330MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate and Dissolved Nitrate as Nitrogen.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Dissolved Sulfate - Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

General Chemistry

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.11		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1033						
Sulfate-Dissolved	85		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1048						

CS 5/22/12

General Chemistry

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.22		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1102						
Sulfate-Dissolved	470		mg/L	9.0	20	100	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0441						

05/22/12

General Chemistry

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.31		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1131						
Sulfate-Dissolved	660		mg/L	9.0	20	100	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0456						

05/22/12

General Chemistry

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.12		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-146885	Analysis Date: 04/18/2012 1159						
Sulfate-Dissolved	410		mg/L	9.0	20	100	300.0
Analysis Batch: 500-146885	Analysis Date: 04/19/2012 0510						

05/22/12

General Chemistry

Client Sample ID: **JP-M9-GWMW330**

Lab Sample ID: 500-45519-6
Client Matrix: Water

Date Sampled: 04/17/2012 1005
Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate-Dissolved	430		mg/L	4.5	10	50	300.0

Analysis Batch: 500-147408 Analysis Date: 04/23/2012 1705

05/22/12

LDC #: 27649B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 5-17-12
SDG #: 500-45519-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: V

METHOD: Dissolved Sulfate, Dissolved Nitrate-N(EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4-16-12 through 4-17-12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
all water

1	JP-M11-GWMW802	11		21		31	
2	JP-M11-GWMW805	12		22		32	
3	JP-M11-GWMW335	13		23		33	
4	JP-M11-GWMW336	14		24		34	
5 2	JP-M9-GWMW330	15		25		35	
6 2	JP-M9-GWMW330MS	16		26		36	
7 2	JP-M9-GWMW330MSD	17		27		37	
8		18		28		38	
9		19 1	PBW1	29		39	
10		20 2	PBW2	30		40	

Notes: _____

LDC #: 27649B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: [signature]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 → 4	W	pH TDS Cl F (circled: NO_3) NO_2 (circled: SO_4) PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
5	↓	pH TDS Cl F NO_3 NO_2 (circled: SO_4) PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
QC 6, 7	↓	pH TDS Cl F NO_3 NO_2 (circled: SO_4) PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 ____ ____
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments: ____________________

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 15 through April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M06-GWMW654
JP-M11-GWMW802
JP-M11-GWMW805
JP-M11-GWMW335
JP-M11-GWMW336
JP-M11-GWMW336MS
JP-M11-GWMW336MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/20/12	L3uPH	2,4,6-Trinitrotoluene	16.6	All samples in SDG 500-45519-1	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M06-GWMW654	RDX 3-Nitrotoluene	182.3 149.1	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M06-GWMW654 JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW336	2,4,6-Trinitrotoluene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
500-45519-1	JP-M06-GWMW654	RDX 3-Nitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (column difference)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M06-GWMW654**

Lab Sample ID: 500-45519-1
Client Matrix: Water

Date Sampled: 04/15/2012 1247
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 2249			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	0.31 J		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	0.18 J		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	1.7		0.032	0.31
2,6-Dinitrotoluene	0.97		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.70		0.035	0.31
4-Amino-2,6-dinitrotoluene	2.2		0.074	0.31
4-Nitrotoluene	11		0.082	0.31
3-Nitrotoluene	0.23 J	J	0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	107		70 - 130

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M06-GWMW654**

Lab Sample ID: 500-45519-1
Client Matrix: Water

Date Sampled: 04/15/2012 1247
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	04/21/2012 1104	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Nitrotoluene	18		0.82	3.1

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-45519-2
Client Matrix: Water

Date Sampled: 04/16/2012 1140
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/20/2012 2341			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	U	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	107		70 - 130

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-45519-3
Client Matrix: Water

Date Sampled: 04/16/2012 1235
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/21/2012 0108			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	U	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	98		70 - 130

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-45519-4
Client Matrix: Water

Date Sampled: 04/16/2012 1325
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/21/2012 0200			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	U	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	101		70 - 130

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-45519-5
Client Matrix: Water

Date Sampled: 04/16/2012 1410
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-146863	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-147010	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	04/21/2012 0251			Injection Volume:	100 uL
Prep Date:	04/19/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	U	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	101		70 - 130

LDC #: 27649B40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/22/12
SDG #: 500-45519-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MA
2nd Reviewer: Q

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/15-4/16/12
II	Initial calibration	A	%RSD ≤ 20%
III.	Calibration verification/ICV	SW	%D ≤ ~~20~~ 15%, ICV/CCV
IV.	Blanks	A	
V	Surrogate recovery	~~SW~~ A	
VI.	Matrix spike/Matrix spike duplicates	~~A A SW~~	MS/D
VII.	Laboratory control samples	~~SW~~ A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	~~SW~~ N	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: WATER

1	JP-M06-GWMW654	11	147010 MB	21		31	
2	JP-M11-GWMW802	12		22		32	
3	JP-M11-GWMW805	13		23		33	
4	JP-M11-GWMW335	14		24		34	
5	JP-M11-GWMW336	15		25		35	
6	JP-M11-GWMW336MS	16		26		36	
7	JP-M11-GWMW336MSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes: _____

LDC #: 27649B40

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: m
2nd Reviewer: C

METHOD: __ GC [✓ HPLC]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

What type of continuing calibration calculation was performed? [✓ %D] or __ %R

[✓ Y] N N/A Were continuing calibration standards analyzed at the required frequencies?

Y [✓ N] N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?

Level IV Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ ~~Column~~	Compound	%D 15.0 (Limit ≤ ~~20.0~~)	RT (limit)	Associated Samples	Qualifications
	4/20/12	04061240_180.d	L3uPH	G	16.6	( )	~~15~~ ALL	J/UJ/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		

LDC #: 27649B40
SDG #: ——→

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC __✓__ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	B	1	182.3	J/A duts
	M	↓	149.1	↓

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 14 through April 15, 2012

LDC Report Date: May 25, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45521-1

Sample Identification

JP-M06-GWMW123R
JP-M07-GWMW124R
JP-M06-GWMW162R
JP-M06-GWMW212R
JP-M06-GWMW995
JP-M06-GWMW313
JP-M06-GWMW318
JP-M06-GWMW319
JP-M06-GWMW652
JP-M06-GWMW994

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

NJ Presumptive evidence of presence of the compound at an estimated quantity.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 20.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JP-M06-GWMW318	1,2-Dinitrobenzene	201 (54-148)	All TCL compounds	J (all detects)	P

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M06-GWMW162R	2,4-Dinitrotoluene	113.0	J (all detects)	A
JP-M06-GWMW212R	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	61.5 60.2	J (all detects) J (all detects)	A
JP-M06-GWMW318	2,6-Dinitrotoluene 2,4-Dinitrotoluene	146.1 176.1	J (all detects) J (all detects)	A
JP-M06-GWMW319	2,4,6-Trinitrotoluene	129.6	J (all detects)	A
JP-M06-GWMW652	4-Amino-2,6-dinitrotoluene	67.5	J (all detects)	A
JP-M06-GWMW994	4-Amino-2,6-dinitrotoluene 4-Nitrotoluene	71.9 57.2	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M06-GWMW123R and JP-M06-GWMW995 and samples JP-M06-GWMW652 and JP-M06-GWMW994 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	JP-M06-GWMW652	JP-M06-GWMW994				
1,3-Dinitrobenzene	9.5	7.9	-	1.6 (≤80)	-	-
2,4,6-Trinitrotoluene	1600	1300	21 (≤25)	-	-	-
2,4-Dinitrotoluene	8400	6800	21 (≤25)	-	-	-
2,6-Dinitrotoluene	3300	2700	20 (≤25)	-	-	-
2-Amino-4,6-dinitrotoluene	360	320	12 (≤25)	-	-	-
4-Amino-4,6-dinitrotoluene	380	320	17 (≤25)	-	-	-
2-Nitrotoluene	44000	35000	23 (≤25)	-	-	-
4-Nitrotoluene	28000	22000	24 (≤25)	-	-	-

JOAAP-GW
Explosives - Data Qualification Summary - SDG 500-45521-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45521-1	JP-M06-GWMW318	All TCL compounds	J (all detects)	P	Surrogate spikes (%R)
500-45521-1	JP-M06-GWMW162R	2,4-Dinitrotoluene	J (all detects)	A	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW212R	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW318	2,6-Dinitrotoluene 2,4-Dinitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW319	2,4,6-Trinitrotoluene	J (all detects)	A	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW652	4-Amino-2,6-dinitrotoluene	J (all detects)	A	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW994	4-Amino-2,6-dinitrotoluene 4-Nitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (%D)

JOAAP-GW
Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45521-1

No Sample Data Qualified in this SDG

JOAAP-GW
Explosives - Field Blank Data Qualification Summary - SDG 500-45521-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW123R**

Lab Sample ID: 500-45521-1
Client Matrix: Water

Date Sampled: 04/14/2012 1000
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/03/2012 1949			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	98		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M07-GWMW124R**

Lab Sample ID: 500-45521-2
Client Matrix: Water

Date Sampled: 04/14/2012 1138
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/03/2012 2041			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	98		70 - 130

ccs/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW162R**

Lab Sample ID: 500-45521-3
Client Matrix: Water

Date Sampled: 04/14/2012 1045
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/03/2012 2132			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	0.27 J	J	0.032	0.31
2,6-Dinitrotoluene	0.14	J	0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	0.70		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	104		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW212R**

Lab Sample ID: 500-45521-4
Client Matrix: Water

Date Sampled: 04/15/2012 1105
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	05/03/2012 2224			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1		1.2	3.1
RDX	<1.6		0.77	1.6
1,3,5-Trinitrobenzene	<1.6		0.39	1.6
1,3-Dinitrobenzene	1.1	J	0.33	1.6
Nitrobenzene	1.9		0.32	1.6
2,4,6-Trinitrotoluene	39		0.36	1.6
Tetryl	<3.9		0.65	3.9
2-Amino-4,6-dinitrotoluene	64 J		0.35	3.1
4-Amino-2,6-dinitrotoluene	51 J		0.74	3.1
3-Nitrotoluene	<3.1		1.4	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	71		70 - 130

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW212R**

Lab Sample ID: 500-45521-4
Client Matrix: Water

Date Sampled: 04/15/2012 1105
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	05/03/2012 2315	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4-Dinitrotoluene	620		3.2	31
2,6-Dinitrotoluene	260		7.1	31

CRS/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW212R**

Lab Sample ID: 500-45521-4
Client Matrix: Water

Date Sampled: 04/15/2012 1105
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	500			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0007	Run Type:	DL2	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Nitrotoluene	4100		41	160
4-Nitrotoluene	2100		41	160

CLS 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW995**

Lab Sample ID: 500-45521-5
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0059			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	104		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW313**

Lab Sample ID: 500-45521-6
Client Matrix: Water

Date Sampled: 04/15/2012 1326
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0242			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	96		70 - 130

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: JP-M06-GWMW318

Lab Sample ID: 500-45521-7
Client Matrix: Water

Date Sampled: 04/14/2012 1300
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	2.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0334			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.62		0.24	0.62
RDX	<0.32		0.15	0.32
1,3,5-Trinitrobenzene	<0.32		0.078	0.32
1,3-Dinitrobenzene	<0.32		0.066	0.32
Nitrobenzene	<0.32		0.064	0.32
2,4,6-Trinitrotoluene	<0.32		0.072	0.32
Tetryl	<0.78		0.13	0.78
2,4-Dinitrotoluene	0.21 J	J	0.064	0.62
2,6-Dinitrotoluene	0.45 J	J	0.14	0.62
2-Amino-4,6-dinitrotoluene	<0.62		0.070	0.62
4-Amino-2,6-dinitrotoluene	<0.62		0.15	0.62
2-Nitrotoluene	<0.62		0.16	0.62
4-Nitrotoluene	<0.62		0.16	0.62
3-Nitrotoluene	<0.62		0.27	0.62

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	201	X	70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW319**

Lab Sample ID: 500-45521-8
Client Matrix: Water

Date Sampled: 04/14/2012 1225
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	2.0			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0425			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.62		0.24	0.62
RDX	<0.32		0.15	0.32
1,3,5-Trinitrobenzene	<0.32		0.078	0.32
1,3-Dinitrobenzene	<0.32		0.066	0.32
Nitrobenzene	<0.32		0.064	0.32
2,4,6-Trinitrotoluene	0.29 J	J	0.072	0.32
Tetryl	<0.78		0.13	0.78
2,4-Dinitrotoluene	<0.62		0.064	0.62
2,6-Dinitrotoluene	<0.62		0.14	0.62
2-Amino-4,6-dinitrotoluene	<0.62		0.070	0.62
4-Amino-2,6-dinitrotoluene	<0.62		0.15	0.62
2-Nitrotoluene	<0.62		0.16	0.62
4-Nitrotoluene	<0.62		0.16	0.62
3-Nitrotoluene	<0.62		0.27	0.62

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	100		70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW652**

Lab Sample ID: 500-45521-9
Client Matrix: Water

Date Sampled: 04/14/2012 1355
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0608			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31		12	31
RDX	<16		7.7	16
1,3,5-Trinitrobenzene	<16		3.9	16
1,3-Dinitrobenzene	9.5	J	3.3	16
Nitrobenzene	<16		3.2	16
Tetryl	<39		6.5	39
2-Amino-4,6-dinitrotoluene	360		3.5	31
4-Amino-2,6-dinitrotoluene	380 J		7.4	31
3-Nitrotoluene	<31		14	31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	0	D	70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW652**

Lab Sample ID: 500-45521-9
Client Matrix: Water

Date Sampled: 04/14/2012 1355
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	500			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0700	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,6-Trinitrotoluene	1600		18	80
2,6-Dinitrotoluene	3300		36	160

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Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW652**

Lab Sample ID: 500-45521-9
Client Matrix: Water

Date Sampled: 04/14/2012 1355
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	2000			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 1304	Run Type:	DL2	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4-Dinitrotoluene	8400		64	620
4-Nitrotoluene	28000		160	620

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Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW652**

Lab Sample ID: 500-45521-9
Client Matrix: Water

Date Sampled: 04/14/2012 1355
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	10000			Final Weight/Volume:	6.0 mL
Analysis Date:	05/07/2012 1331	Run Type:	DL3	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Nitrotoluene	44000		820	3100

CES 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW994**

Lab Sample ID: 500-45521-10
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0843			Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31		12	31
RDX	<16		7.7	16
1,3,5-Trinitrobenzene	<16		3.9	16
1,3-Dinitrobenzene	7.9	J	3.3	16
Nitrobenzene	<16		3.2	16
Tetryl	<39		6.5	39
2-Amino-4,6-dinitrotoluene	320		3.5	31
4-Amino-2,6-dinitrotoluene	320 J		7.4	31
3-Nitrotoluene	<31		14	31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	0	D	70 - 130

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW994**

Lab Sample ID: 500-45521-10
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	500			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 0935	Run Type:	DL	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,6-Trinitrotoluene	1300		18	80
2,6-Dinitrotoluene	2700		36	160

05/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW994**

Lab Sample ID: 500-45521-10
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	1000			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 1209	Run Type:	DL2	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4-Dinitrotoluene	6800		32	310

CRS 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW994**

Lab Sample ID: 500-45521-10
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	2000			Final Weight/Volume:	6.0 mL
Analysis Date:	05/04/2012 1355	Run Type:	DL3	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
4-Nitrotoluene	22000 J		160	620

CES 5/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID: **JP-M06-GWMW994**

Lab Sample ID: 500-45521-10
Client Matrix: Water

Date Sampled: 04/14/2012 1200
Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-148612	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-146956	Initial Weight/Volume:	770 mL
Dilution:	5000			Final Weight/Volume:	6.0 mL
Analysis Date:	05/07/2012 1515	Run Type:	DL4	Injection Volume:	100 uL
Prep Date:	04/19/2012 1030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2-Nitrotoluene	35000		410	1600

05/30/12

LDC #: 27649C40 **VALIDATION COMPLETENESS WORKSHEET** Date: 5/23/12
SDG #: 500-45521-1 Level III Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: AA
2nd Reviewer: CL

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/14/12 - 4/15/12
II	Initial calibration	A	%RSD ≤ 20%.
III.	Calibration verification/ICV	A	%D ≤ 20%., ICV/CCV
IV.	Blanks	A	
V	Surrogate recovery	SW	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	~~A~~ SW	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	~~SW~~ A	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	SW **	FD1=1,7 FD2=11,15
XIII.	Field blanks	~~NB~~	~~SB~~

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

**ND

Validated Samples:

1	JP-M06-GWMW123R	11	JP-M06-GWMW652	21	146956MB	31	
2	JP-M07-GWMW124R	12	~~JP-M06-GWMW652DL~~	22		32	
3	JP-M06-GWMW162R	13	JP-M06-GWMW652DL2	23		33	
4	JP-M06-GWMW212R	14	~~JP-M06-GWMW652DL~~3	24		34	
5	~~JP-M06-GWMW212RDL~~	15	JP-M06-GWMW994	25		35	
6	~~JP-M06-GWMW212RDL2~~	16	~~JP-M06-GWMW994DL~~	26		36	
7	JP-M06-GWMW995	17	JP-M06-GWMW994DL2	27		37	
8	JP-M06-GWMW313	18	JP-M06-GWMW994DL3	28		38	
9	JP-M06-GWMW318	19	~~JP-M06-GWMW994DL~~4	29		39	
10	JP-M06-GWMW319	20		30		40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ___/HPLC

8310	8330	8151	8141	8141 (Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes: _____

LDC #: 27649C40

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: MA
2nd Reviewer: CL

METHOD: ___ GC ___/HPLC
Are surrogates required by the method? Yes ___/___ or No ___.
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were surrogates spiked into all samples and blanks?
Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ (Column)	Surrogate Compound	%R (Limits)	Qualifications
	4 (100X-500X)	L3uPH	Z	O (54-148)	No Qual.
	9 (2X)			201 ( )	J/P dets.
	11 (100X-10,000X)			O ( )	No Qual
	15 (100X-5,000X)	↓	↓	↓ ( )	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	1,2-DINITROBENZENE
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 27649C40
SDG #:

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: MH
2nd Reviewer: AC

METHOD: ___ GC ✓ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N (N/A) Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N ~~N/A~~ Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	J	3	113.0	J dets./A
	H	4	61.5	
	I	↓	60.2	
	K	9	146.1	
	J	↓	176.1	
	G	10	129.6	
	H	11	67.5	
	H	15	71.9	
	N	↓	57.2	↓

Comments: _____

LDC#: 27649C40

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: AA
2nd Reviewer: [illegible]

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

(Y)N NA Were field duplicate pairs identified in this SDG?
(Y)N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L) 11	Concentration (ug/L) 15	(≤ 25) RPD	(ug/L) Difference	Qualifications (Parent Only)
D	9.5	7.9		1.6 (limit ≤ 80)	No Qual.
G	1600	1300	21		↓
J	8400	6800	21		
K	3300	2700	20		
I	360	320	12		
H	380	320	17		

Analyte	Concentration (ug/L) 11	Concentration (ug/L) 15	(≤ 25) RPD	(ug/L) Difference	Qualifications (Parent Only)
L	44000	35000	23		No Qual
N	28000	22000	24		↓